THE OIL WEEKLY

ENGINEERING « NEWS » STATISTICS

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Oil Man's Calendar

OCT.	
11-15	**National Safety Congress & Exposition, Kansas City, Missouri.**
11-16	**Oil-World Exposition, Houston, Texas.**
13-14	**Indiana Independent Petroleum Association, Indianapolis, Ind.**
13-15	**Institution of Mechanical Engineers, London, England, discussion on Lubricants and Lubrication.**
14-15	**Interstate Oil Compact Commission, Rice Hotel, Houston, Texas.**
14-16	**American Association of Petroleum Geologists, Mid-Year Meeting, Pittsburgh, Pennsylvania.**
14-16	**Independent Petroleum Association of America, Houston, Texas.**
18-22	**American Welding Society, Atlantic City, New Jersey.**
18-23	**American Institute of Mining & Metal Engineers, Atlantic City.**
26	**Mid-Continent Oil & Gas Association, Annual Membership Meeting, Louisiana-Arkansas Division, Shreveport, Louisiana.**
27-28	**Indiana Independent Petroleum Association, Indianapolis, Ind.**
29-30	**Mid-Continent Oil and Gas Association, Texas Division, Baker Hotel, Dallas, Texas.**
NOV.	
8-12	**American Petroleum Institute, (Annual), Chicago, Illinois.**
19	**Mid-Continent Oil and Gas Association, Annual Membership Meeting, Kansas-Oklahoma Division, Tulsa, Oklahoma.**
DEC.	
6-10	**American Society of Mechanical Engineers, New York.**
1938	
MAR.	
16-18	**Annual Meeting, American Association of Petroleum Geologists, Roosevelt Hotel, New Orleans, La.**

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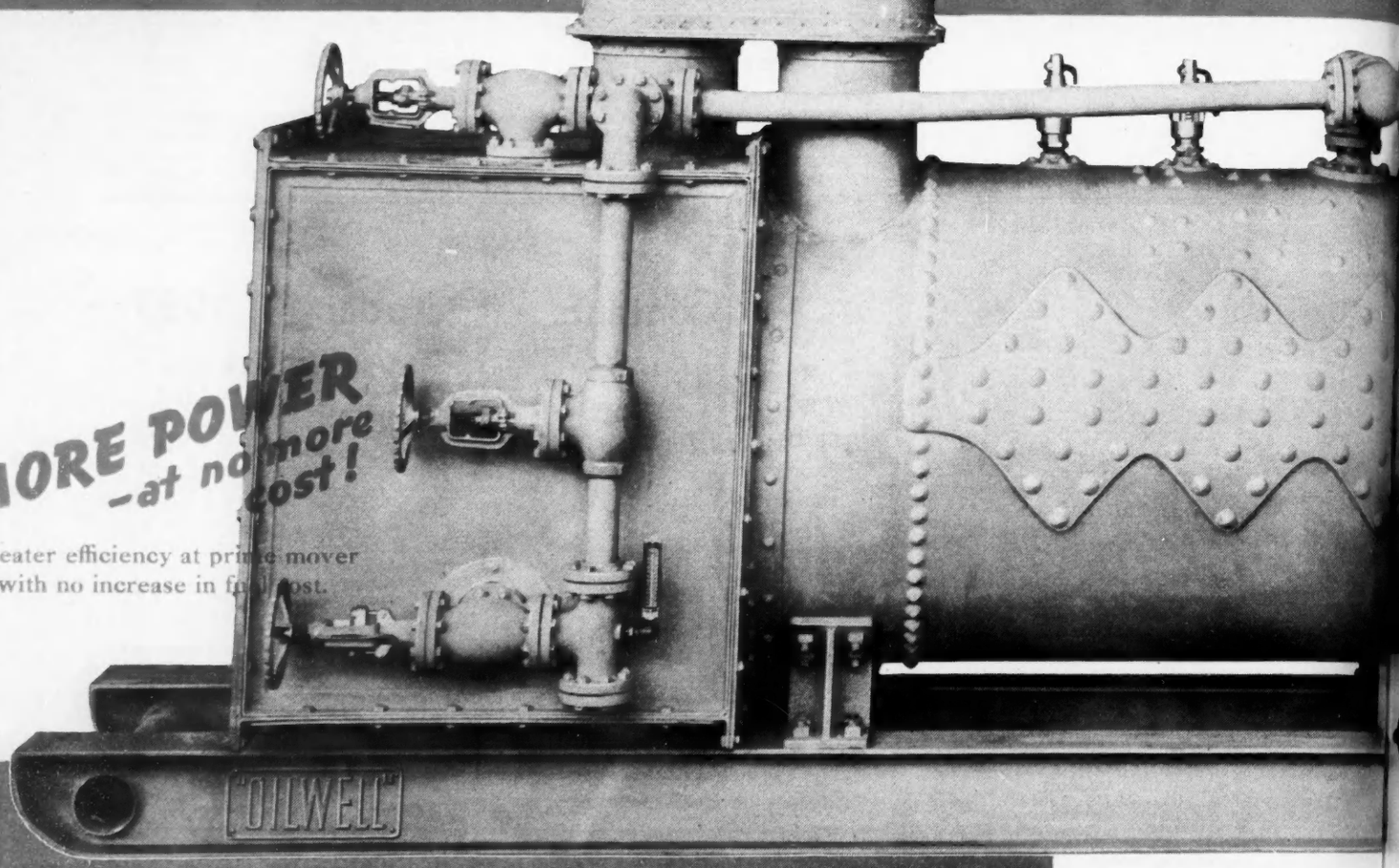

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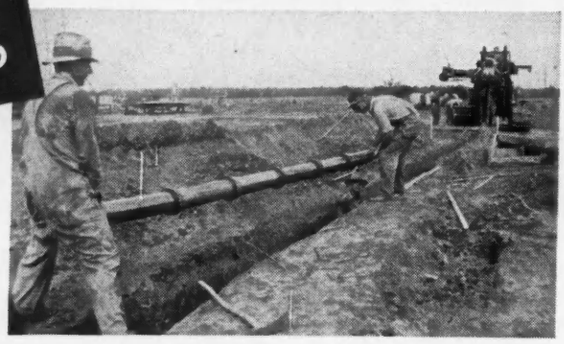

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LOOKING AHEAD

WITH THE EDITOR

Preventing Regulator Freezing . . .

Value of Dehydration Plants . . .

WITH several million domestic and industrial users dependent upon uninterrupted delivery of natural gas as a source of heat energy, continuity of service is of first importance to concerns engaged in the transportation and sale of this valued commodity. Recent years have witnessed the expansion of great transportation lines across the nation, and the problem has become of more significance as a result. Fortunately, engineers have gone a long way toward solving the difficulty in the past few years. They now know that certain measures will assist in preventing the freezing of gas regulators—long the bugaboo during cold winter spells. Likewise, they have learned that gas which is clean, dry and reasonably free from hydrocarbon fractions is a necessity.

In this issue starts the first of a series of articles on "The Problem of Preventing Regulator Freezing." It is an exhaustive discussion of the problem and the practices found successful. The second part of this series is to appear in an early issue.

An important dehydrating plant located on a large interstate gas line delivering gas in the northern Mid-Continent and Middle West is to be the subject of an early article.

The presentation of these articles is of importance and value. While considerable has been published on the subject of regulator freezing, never before has there been such a comprehensive and authoritative discussion as the one by M. L. Hardie, which starts in this number. The new practice of installing dehydration plants has been in vogue sufficiently long to provide some definite figures on results, but previously little of this nature has been available for publication.

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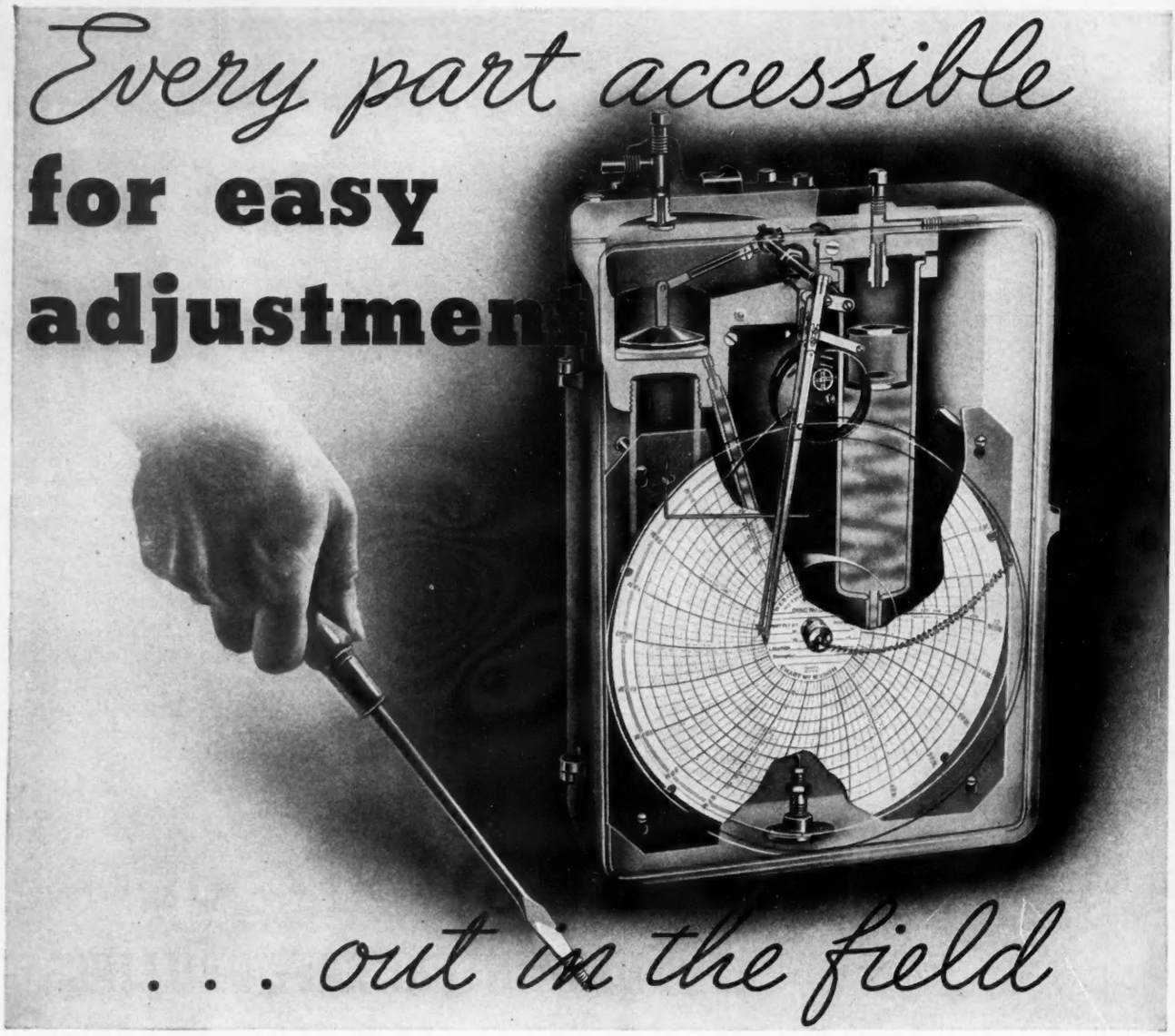

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See the full line of American Meter Company instruments at the Houston **OIL-WORLD EXPOSITION,** *Oct. 11-16. The exhibit will be in charge of the Westcott & Greis division of American Meter Company.*

The changing panorama

this week

COMPETING this week for the attention of oil men will be two exceptionally important groups of developments—at Houston and Madison.

The Oil-World Exposition at Houston October 11-October 16, like a circus, will have numerous side attractions in addition to the main show; as various associations will hold meetings in the city, simultaneously with the showing of equipment now available to all branches of the petroleum industry. The equipment show itself promises to be especially interesting, as it will reveal the great strides that are being made by the suppliers of the industry, as time marches on.

Further important developments are in store for the week in the trial of the oil companies at Madison, which opened a week ago, with the concerns and prominent executives of the companies facing charges of having violated the federal anti-trust laws, in setting prices of gasoline.

Irish Judge and 14 Jurors

At Madison in the first week of the trial came various developments of importance and of interest.

Federal Judge Patrick L. Stone of the Western District of Wisconsin, described as a liberal, New Deal Judge, and as a neat Irishman with a sense of humor and the appearance of a scrapper, speeded selection of jurors, which was finished in a day.

In addition to the 12 regular jurors, 2 alternate jurors were chosen, and will hear the testimony, since the trial is expected to be costly and long, possibly lasting 8 weeks or longer. The jurors will have comparatively little freedom in the meantime. They will be held together in custody of the United States marshal throughout the trial, under orders of the judge, who insisted he did not want the case tried in the newspapers but on the facts as brought out in the court room.

The list of regular jurors includes: 4 farmers, 2 retired farmers, 2 garage owners, 1 merchant, 1 real estate man, 1 carpenter, 1 retired switchman. The 2 alternate jurors are: 1 farmer, 1 fox breeder. All the 14 jurors are men, and their average age is 48 years.

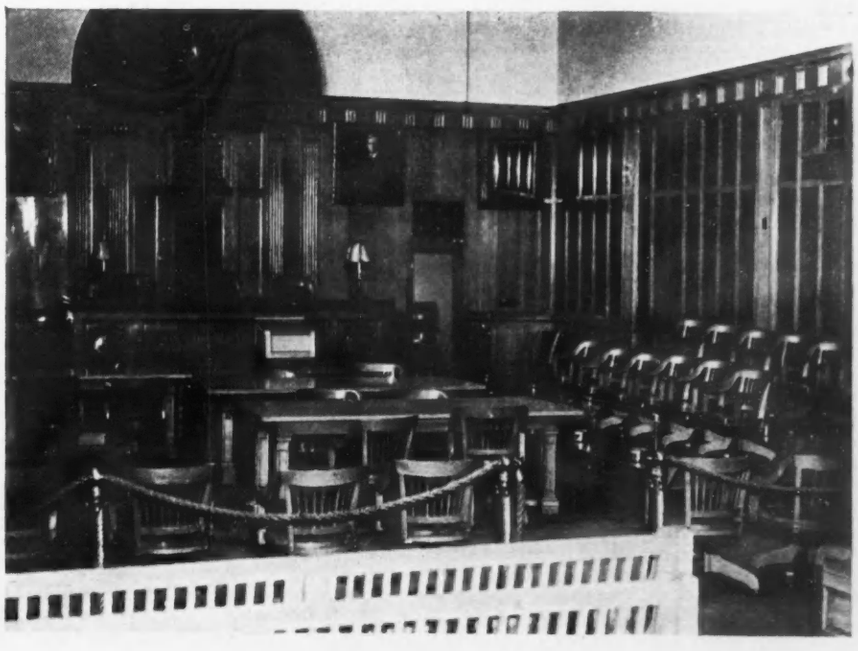
90 Lawyers in a Court Room

The defendants include 18 major oil companies, 5 subsidiaries, 3 publications, and 46 executives of the defendant companies, all charged with violating the Sherman anti-trust law by fixing gasoline prices in 10 Middle Western states, between March, 1935, and December, 1936.

In a court room built for 200, it was difficult to accommodate the 46 defendants, 90 lawyers, 35 newspaper men, and the 80 members of the jury panel.

NRA-Blue Eagle Exhumed

The trial got under way with a startling request by Special Assistant Attorney General Hammond E. Chaffetz, in charge of the prosecution, that defendants not be permitted to argue the NIRA oil code as a part of the defense. The judge ruled that the defendants may claim government approval for operations described in



THE OIL CONSPIRACY TRIAL is being held in this courtroom. At the right of the picture are shown the jurors' chairs. In the center foreground are the attorney's tables, while in the rear is the judge's bench. Spectator's seats, behind the ropes seen in the extreme foreground, are being used by the overflow of newspaper men and those connected with the trial.

the indictment as an anti-trust conspiracy, only if they produce competent proof of such approval.

Thereuon, Col. William J. Donovan, of New York, chief of the defense counsel, immediately set out to show that actions of defendants that are complained of were predicated upon and justified by the National Industrial Recovery Act and the petroleum code set up under that law.

NRA Sanction of Acts Claimed

Donovan asserted that the defendant companies had set up the complained-of gasoline buying pools to absorb over-supplies with which little, independent refiners were distressed; that the large companies did not initiate the buying-pools but participated in it only when the independent refiners went to them and the government for help; that the aid then given actually promoted the preservation, rather than destruction, of competition. The buying pool was, the attorney contended, wholly in accordance with the spirit of the NRA, through which the government sought to alleviate distressed industries, to increase employment, and to revive and restore commerce.

In the indictment, however, it is charged that the oil companies eventually went on to other things that resulted in artificially high wholesale prices and in serious damage to independent jobbers.

★ ★ ★ ★ ★

Drilling results

Kansas again ranked high with Barton County the center of interest. Here a new field was opened and two were extended. A new gas area was discovered in Barber County.

The second largest producer completed in the current Illinois drilling campaign was completed last week with an initial flow of 2500 barrels. It is located in the Noble field of Richland County. Another Illinois test gave indications of providing a new pool in the Wayne area of that county.

Oklahoma developments were more encouraging, as the Jesse field was extended and a test north of Fitts started producing from the Hunton lime to renew activity in that area. Meanwhile, a closely watched wildcat in Lincoln County was stricken from the list.

Highlight of developments in South Texas was the virtual assuring of a second Greta sand producing area. The discovery well is 5½ miles northeast of a well that recently produced from the same horizon, but is generally believed to be on a separate structure. In the Mirando district of South Texas, a well located 14 miles west of Hebbronville, and on a trend with the Cole-O'Hern production, is expected to prove a big wet gas producer. Nearest production is a half-mile east. Another small Hockleyensis sand field in Bee County rounded out the new strikes in this region.

In South Louisiana a well three-quarters mile east of production at Lafitte, Jefferson County, has cored sand showing oil at 12,009 to 12,030 feet in Oligocene formation and may become the world's deepest producer. It is the furthest well down dip to show oil in Oligocene formation.

South of Segno, Polk County, Texas Gulf Coast, Gulf Oil Corporation's Wing 8 has cored several hundred feet of sand in Upper and Lower Saline Bayou formation which will lead to deeper drilling along the Conroe trend. It is also a deeper sand for the field.

As a result of two Dundee limestone failures, and a third test showing for but a small pumper, it was indicated that the most important active field in Michigan, Buckeye in Gladwin County, was limited definitely on three flanks.

Indications last week were that the new deep pay in the Schuler field of Arkansas may be more consistent than the five upper lenses that have produced earlier.

Activity at Lance Creek was given further impetus when Minnelusa sand production was extended slightly to the southwest. A recovery of 35,000 barrels per acre is expected in this field, which is now nearly five miles long.

Market briefs

Outlook—Strict crude control is encouraging.

Crude Market—Generally steady.

Refined Oil Markets—Gasoline continues unsteady.

CURRENT OPERATIONS

Week Ended	Daily Crude Production	Daily Crude Runs to Stills
October 2	3,647,450	3,400,000
Previous week	3,666,300	*3,455,000
Year ago	2,987,800	3,000,000

CRUDE STOCKS

DATE	Crude Oil (Barrels)
September 25	307,974,000
Week ago	309,405,000
Year ago	294,568,000

REFINED OIL STOCKS

DATE	Gasoline (Barrels)	Gas & Fuel Oil (Barrels)
October 2	65,266,000	117,076,000
Week ago	65,620,000	116,472,000
Year ago	57,610,000	112,712,000

DRILLING

PERIOD	Wells Completed
Past week	624
Previous week	659
Year ago	533
Year Total:	
This year	22,633
Last year	18,784

* All time peak.

Technology

Several important every day problems are discussed in our technical section this week.

The treating of emulsified oil is one that has been with the industry since its inception. Much progress has been made, and two articles in this number describe some of the advancements. One of these articles, page 76, tells about a dehydrator plant in which the proper utilization of heat has lowered treating costs 10 percent, and added considerable to the revenue. These two factors will result in the installation cost being returned in 17 months time. The other article, page 111, discusses the difficult treating problems encountered at Talco. Remarkable progress has been made in overcoming early troubles.

Every essential part of the orifice meter setting must function correctly if accurate measurement is to result. Therefore, it is important, it is declared in our "Equipment Care Series" article this week, page 71, that no part be neglected. How to do this? Read the article by Pat H. Miller.

What to do with water encroachment that threatens the lives of our oil wells is another old question still to be fought. It has arisen in East Texas, and operators are resorting to the plugging back of wells. Modern methods, such as described on page 74, are aiding greatly.

The freezing of regulators is one of the foremost difficulties confronting companies that must deliver a constant supply of gas to their many customers. A committee for the Study of Practical Methods for Preventing Regulator Freezing has made an elaborate report. It commences on page 78.

Pressure drilling is one of the newer developments. An inspection of pressure drilling operations at Kettleman Hills shows that the initial production rate is benefitted when the method is used. The practices and results in this field appear on page 92.

The spacing of wells, while not new, has received greater attention in recent years, and many new theories have been advanced. In an article on page 100, it is advocated that when new fields are found that wide spacing be adopted—then be decreased if found necessary. This, it is said, would prevent the drilling of unnecessary wells—a practice declared to be prevalent today.

The Industry's Right Arm

By RAY L. DUDLEY

One is accustomed to think of the airplane or automotive industries as representing the apex of mechanical and scientific development in this age of progress.

Yet we doubt if there is any industry which has shown the development progress in means and methods achieved by the oil industry during the past decade, a record of progress to which new features are being added constantly.

New records in drilling depths, new records in speed, in accuracy, in safety, are being added rapidly. Much of this progress is to be laid at the door of the amazing growth in the number of engineers entering the oil country service these days, but by no means all of it.

Manufacturing and service companies really have more than kept pace in the application of scientific and engineering principles practiced by the industry.

The record is too long and too impressive to be set down in detail in this comment, but it is well for the industry to weigh the aid rendered by those companies serving the industry.

First probably should be recorded the development in metallurgy, because without this development the other scientific aids to drilling, and to chemical engineering in the refining industry, would not be as necessary or important as they now are. A study of pipe alone as revealed in technical books printed fifteen to twenty years ago, and those printed now or the specifications shown in A.P.I. standards, shows improvement little short of amazing. Alloy steels for use in accessory equipment, bits, valves, coring equipment, transmission equipment, etc., have played a tremendous part.

In the operating end we have seen improvements in design which have more than kept pace with the automotive industry. Prime movers; rotaries; draw-works; tool joints; drill collars; special drill pipe; boilers; pre-heating equipment; pressure-control equipment, especially; pressure-drilling equipment; transmission design and performance; coring, core-drilling; cement retainers to hasten and improve a most necessary job; development and improvement of methods of determining constantly the weight and strain on a string of drill pipe, these and many more have made it possible for the oil company engineer and operating staff to perform as daily tasks those things which would have been little short of miracles fifteen years ago.

The development of these aids to operations has come so steadily that their effect has not been fully appreciated.

In the service field the development has been fully as great. We read today of a service which will take samples of cores and orient them to determine direction of stratification; electrical logging which has revolutionized development methods and saved many an important oil field; geophysical methods of locating structures; devices for testing formations to determine in advance necessary setting and production practices; the gun-perforation of pipe in the hole at producing-formation levels—a standard practice today; a vast improvement in cementing technique through improved equipment and service; greatly improved cement, itself; improvements in mud-weighting and pressure control through proper mud-conditioning—a necessary aid in handling high pressures in drilling wells; well surveying; directional drilling; welding—the record runs on and on—ALL developments by that right arm of the oil industry—the manufacturer and service man.

And in the field of actual production itself again the manufacturer has rendered a service not one whit less necessary and valuable than that offered to the drilling crew. From the bottom of the hole to the top—and in between, there has been a revolution in ten year's time.

Geared pumping units, improved pumps in the hole, improved sucker-rods are examples. The first electrical dehydrating unit was offered the oil industry by a manufacturer to replace the wasteful "cooking" system, less than twenty years ago. Gas traps during that period have replaced the old "shot-gun" method of separating oil and gas. Vapor-proof tanks, both field and general storage, have lessened not only vapor losses but losses by fire. With far more tanks in service today than were in service twenty years ago we have far less losses from lightning—thanks to the work of the tank manufacturer.

Less spectacular but equally efficient has been the progress in pipe-line construction and operation. Lighter, higher-speed prime movers and pumps, special casing for gas-line work, use of corrosion protection measures, coating and cathodic units, all have seen the manufacturer busily engaged in helping to achieve more efficient and economical operation.

Why this dissertation? We have been reading the development of equipment and service over a period of twenty years as recorded in the messages presented the oil industry by manufacturers through the advertising pages of THE OIL WEEKLY. The record is nothing short of amazing. We have been studying equipment of yester-year as compared with that which will be displayed at the Oil-World Exposition. And the record is not yet complete. It has been our privilege recently to see research work being done by some manufacturers and service companies which will be as revolutionary as anything we have seen in the past. And we know that for each one we have seen there are many more "under wraps" which will not be brought to attention until they are ready for practical use.

If the oil industry had not become "engineering minded" many of these developments we have seen and will see, would not reach their full value to the oil industry. The point we would make is that the oil industry and its right arm have been doing a good job together. Close cooperation will improve that job in the future.

Oil in the Courts

Big anti-trust trial at Madison opens with heated arguments over defense references to federal government sanction of alleged buying pool . . . Jury is selected without much difficulty.

A PARTLY successful attempt of prosecution attorneys to limit defense testimony and court condemnation of prejudicial newspaper articles marked the opening of the government's trial of 18 major oil companies, 6 subsidiaries, 46 individuals and 3 trade journals in federal court at Madison last week.

In a court room crowded to capacity by defendants, defense and government attorneys, press reporters and trade journal writers, and from which the public was necessarily barred, the trial which is undoubtedly the greatest anti-trust prosecution since breaking up of the Standard Oil and American Tobacco companies more than two decades ago was officially opened before Federal Judge Patrick T. Stone at 10.03 a.m. October 4.

Differing from previous prosecutions under the 47-year-old Sherman Act, however, the current case involves varying opinions of the application of the act to present-day business. The defendants have been indicted in the present case, defense attorneys point out, for carrying out a market stabilization program encouraged and sanctioned under the National Recovery Act.

Hammond E. Chaffetz, of government counsel, following selection of the jury but before that body was brought in to hear the case, asked a court ruling prohibiting defense counsel from discussing before the jury the "reasonableness" of their activities or that the actions upon which the indictment is based had governmental approval in the absence of written proof from President Franklin D. Roosevelt or Secretary of the Interior Harold L. Ickes.

Strenuous objections to the government's demand by Col. William J. Donovan, New York, chief defense counsel, caused Judge Stone to temporarily withhold a ruling. On Wednesday, however, the court declared that defense attorneys would be prohibited from claiming governmental approval in opening statements to the jury, but would be free to bring in evidence on the point, subject to rulings of the court upon submission, during the course of the trial.

Later in the week when Donovan, in his opening statement to the jury, mentioned as "a vital element in the defense" a letter from Secretary Ickes to Charles E. Arnott, Vice President of Socony-Vacuum Oil Company, the court did not stop him. The letter asked Arnott to direct a government price-stabilizing program.

In a word battle between opposing counsel following delivery of Donovan's opening statement, William P. Crawford, of government counsel, declared that at the proper time the prosecution will object to the defense statement almost in its entirety as improper. He termed Donovan's conduct as a "challenge to the court."

Chaffetz' demand, which also sought a ruling that evidence be heard on the sole issue of whether the defendants had entered into an agreement to raise and fix gasoline prices in violation of the anti-trust laws, was plainly a surprise to defense attorneys as well as veteran court observers covering the trial.

"This is a case of magnitude," Chaffetz said, "and it is imperative to the govern-

The Oil Trust Jury

HERE is the jury comprised of Wisconsin farmers and small town businessmen who will determine the fate of major oil companies, oil company officials and trade journals now on trial in federal court at Madison for alleged conspiracy to violate the Sherman anti-trust act. Fourteen jurors were chosen in the event that one or two may be unable, for some unforeseen reason, to hear testimony throughout the trial, which court attaches estimate will last three or more months.

In the front row, left to right, are Earl Hibbard, Knowlton farmer, an alternate; James Mullen, Spring Green, realtor; Charles Burnham, Lone Rock, retired farmer; S. W. Grenzow, Monticello, grocer; Hiram Nelson, Stoughton, retired, and Frank Brechler, Marathon, retired railway employe. In the back row, left to right, are Sam McGaw, Madison, farmer; Neal Larson, Deerfield, retired farmer; Clifford Huber, Brooks, fox farmer, the second alternate; Philip Hanson, Blue River, farmer; Joseph Kalscheur, Klevenville, carpenter; Harry Fullert, Marshall, mechanic; Charles Noonan, Union Center, garage man, and E. N. Slattery, Rudolph, farmer.

ment that the trial not be dragged out by irrelevant issues. We assume that some apparently formidable theories will be raised by the defense. Now, price fixing by those in control of the oil industry is illegal in and of itself. The history of the price-fixing motive, good or bad, is not relevant. The broad issue is whether the defendants entered into a conspiracy as charged. If they did, they are guilty.

"Apparently the defense will contend that the jury be permitted to hear testimony as to the reasonableness of their activities, the background of this case Reasonableness is not a defense. There are suggestions of another possible defense: that is, that the defense at some time or other had approval of their actions under the NRA.

"The NRA was terminated in May, 1935. It is charged that this conspiracy began in February or March, 1935, and continued to the end of 1936. Such a defense would be only partial. The action charged never was approved by the government; never was intended to be submitted. They may try to show something else, persuade the jury that they had approval, create issues that will take weeks and months to try. The question is one of law for the court and not of fact for the jury whether their action had approval and the Sherman Act was suspended for them."

"Never have I heard any statement so astounding or so novel made by a prosecutor," Donovan told the court after hearing the government's request. "It may be heard in courts where the defendant is presumed guilty, but not in courts of justice. What the prosecution wants is for the defense to present its case before the trial even opens.

"The net in this," Donovan continued, "that we do not know the defense, but that we would compel a statement of the defense before we make a statement to the jury. That is a new doctrine of justice in America."

Judge Stone expressed the opinion that it might be well to define the issue, declaring that if there was approval of conduct by the government it must under the law be expressed in written form by the President or the Secretary of the Interior. He added that the court ought to know whether there was such written agreement.

"Your honor cannot prejudge this case until all the facts are known," Donovan said. "This is a question of fact, as government counsel pointed out. Why are we compelled to state now what will be our proof?"

"If you have such approval," interjected Judge Stone, "such evidence will be admissible. If not, the court ought to know."

"The proof we claim is clearly evidence of the authority and approval of the secretary of the interior," Donovan said.

"Is it written approval?" asked the court..

"We claim that it is both written and oral," said Donovan.

Chaffetz told the court that he knew what "writing" defense counsel had, and that it did not represent proper authority to engage in the practices upon which the charges are based.

"The only approval sufficient is that written by the President or the Secretary of the Interior," the court said. "Do you have that written document?"

"We cannot be compelled now to submit our evidence," said Donovan. "This is a criminal case. They must be bound by the rules of our constitution in protection of the defendants. Intent is an essential element here. We are making our fight here and now on that issue."

Declaring that the government counsel were not only trying to prosecute the case but were also attempting to limit the defense, he contiued: "They're not going to do it. We have rights here and the defendants have rights here, and we're going to protect those rights. I must submit to the opinion of your honor, but I cannot be compelled to submit to the court now any evidence we may have to disprove the government's case. I have said all I'm going to say now. I'm asking no quarter from the prosecution. I know your honor is going to compel this defense to do what no other defense must do."

Deny Interior Department Request

The question was precipitated again Wednesday following the government's opening statement to the jury. Heated argument between government and defense counsel brought denial by government counsel that the Department of the Interior had requested the Department of Justice not to prosecute the defendants.

"In effect," Donovan demanded, "did not the Department of the Interior ask the Department of Justice not to bring this suit because the Department of the Interior had approved of the course followed by these defendants?"

Chaffetz shouted: "Positively not, and I welcome the opportunity to say so. The Department of the Interior specifically denied approval of the actions covered in this indictment."

Charles Francis, Houston attorney representing The Pure Oil Company, entered the argument and told the court:

"I want to tell the jury, unless the court stops me, that the Secreatry of the Interior approved of what my client did. We did buy from independent refiners; had done so for years. And when Charles E. Arnott, as stabilization officer authorized by Secretary Ickes, was going about the country, holding public meetings, he told The Pure Oil Company that the government program could not succeed if Pure Oil purchases were not distributed among various refiners. The court will not preclude such proof, will it?"

In their opening statements to the jury defense counsel had previously referred to Arnott, vice president of Socony-Vacuum Oil Company, as the "master mind" of the conspiracy and that meetings at which the buying programs were planned were "secret" meetings.

Donovan produced copies of the petroleum code approved under the NRA and declared "absurd" any claim that every step taken under the code must receive formal approval of Secretary Ickes, administrator of the code.

"Our code was a voluntary code, the kind of a partnership the President had talked about wanting," he told the court.

Judge Stone told defense counsel "you'd better refrain from claiming approval in your opening statement," adding: "If you're going to claim government approval of conduct prior to February, 1935, you must have evidence of formal written approval by the Secretary of the Interior or some other person authorized by statute." Later he declared, however, that "when a man is charged with a crime, he ought to have the right to prove any facts or circumstances that may tend to explain his conduct."

Donovan told the jury that the price-stabilization program for which the defendants are now being tried was a continuation of the government's program when the government turned from compulsion, under the code, to persuasion. Conditions in the industry, he declared, made it imperative that "something be done and done quickly."

Handicapped by limitations placed on his statement by the court, he outlined the defense: "What these men did they had a right under the law to do, that they attempted honestly and earnestly to correct abuses caused by unfair competitive methods, that they sought to remove those obstacles that stood in the way of healthy competition, that what they did was justified by the economic needs of the industry, was promotive of the public interest and had the sanction of the law regardless of any National Recovery Act. There was no conspiracy, gentlemen. We hatched nothing. The government says our objectives were unlawful and our purposes sinister. We will show that they were not."

Donovan charged the prosecution was inspired in part by jobbers who "trafficked in hot oil."

"The jobber," Donovan said, "is an important factor in the marketing end of the industry. Without him most of these defendants can not properly market their products. The government would have you believe these defendants want to drive the jobbers out of business. That's not the issue in this case and it isn't true." He added that disagreements with jobbers were mainly with "jobbers who trafficked in hot gasoline and profited by the demoralization of the industry. This kind of jobber fought the effort of states and the federal government to stop the traffic in hot oil. They openly and brazenly lobbied against the administration's efforts to stop the illegal traffic.

"We told the government and the public what we did. It stands to reason there was no conspiracy or violation of law. The industry was regulated by the NRA code when the alleged offenses took place. There was no conspiracy. We will show that what the so-called master mind, Charles E. Arnott did was requested and authorized by Secretary Ickes from a government building in Washington. Our position is that these defendants acted within the law, that what they did was to relieve a condition that threatened to destroy the industry, and what was done was to foster fair, competitive prices.

"We and not the prosecution are upholding the law and the public interest in this case. We believe what these prosecutors would do is to break down a great work of constructive progress that had the approval of the President and the Secretary of the Interior."

Following his statement, Donovan was criticized by the court for bringing the President into his discussion, terming it hearsay and incompetent as evidence. "You know and I know that the President will not be a witness," Judge Stone said.

In arguments between counsel that followed, Judge Stone asked: "Do you think your opening statement was fair?" "I think my statement more closely adhered to the rules of procedure than that of the government."

The court held that the defense

statement was "too argumentative."

"I take exception to the court's limitation of my statement and restrictions of evidence," Donovan declared. "I may be stupid, but I still don't understand the limitations on which I may proceed."

Jury to Keep Together

Judge Stone, in announcing before selection of the jury that jurors would be kept in custody of the United States marshal for the duration of the trial and would not be permitted to read newspapers or magazines giving accounts of the case, attacked prejudicial articles appearing in newspapers before opening of the trial.

During the course of the defense opening statement to the jury presented by W. P. Crawford, Superior, the matter of prejudicial statements concerning the wealth of the defendants was again raised.

"It is a terrible thing," Crawford said, "that a group of influential millionaires, perhaps billionaires, should take over the power to fix prices of gasoline paid by the entire consuming public."

Donovan objected that Crawford's remarks about "millionaires and billionaires" were inflammatory.

"Any reference to the wealth of individuals is immaterial," Judge Stone ruled. "A man of wealth has as much standing in court as a poor man."

Donovan added that "it has not been established that these defendants are men of wealth."

Fourteen on Jury

Selection of the jury occupied the court during the entire first day. Fourteen jurors were chosen, 2 to be on hand in the event that 1 or 2 of the original 12 are unable to complete the trial. They come from small towns and farming communities of Western Wisconsin. The youngest is 30, the oldest 63.

Jurors were questioned concerning their connections with oil companies or firms selling gasoline or oil at wholesale or retail, their or their families' connections with governmental positions. A number of prospective jurors were excused when they told the court they did not think their physical condition would permit them to sit through the lengthy trial.

Frank Brechler, 52, Marathon, retired bridge construction foreman; Charles Noonan, 30, Union Center, garageman; Hiram Nelson, 63, Stoughton, retired; Philip Hanson, 50, Blue River, farmer; Joseph Kalscheur, 35, Klevenville, carpenter; S. W. Grenzow, 55, Monticello, merchant; Harry Fullert, 42, Marshall, mechanic; Sam McGaw, Madison, farmer; E. M. Slattery, 50, Rudolph, farmer; Neal Larson, 55, Deerfield, retired farmer; Charles Burnham, 55, Lone Rock, farmer; James Mullen, 53, Spring Green, realtor. Alternates are Clifford Huber, 41, Brooks, fox farm operator and Earl Hibbard, Knowlton, farmer.

Judge Stone told jurors that, while they would be kept in the custody of the marshal throughout the trial, they would be given opportunities for recreation. He explained the plan of keeping them together was his, not that of defense or government attorneys. His statement came after Donovan, earlier in the day, asked the court to consider that, if jurors were kept in custody for so long a period, as the trial dragged on through successive weeks, "each day may become one of resentment towards the defendants."

The court declared that defendants may, during the trial, absent themselves from the court room for "valid reasons" upon application to the court.

Government counsel, in their opening statement to the jury, closely followed the text of the indictment, coloring and detailing the charges for the benefit of the jurors. They were told that the government would produce testimony from the mouths of "hostile witnesses" that the major companies engaged in "one of the most gigantic, far reaching and withering conspiracies ever attempted in the history of the anti-trust act."

Key Witnesses

It was revealed that government "key witnesses" would be R. M. Cline, Tyler, Texas, of the East Texas Refiners Marketing Association; Neal Buckley, of Cities Service Company, and Walter Paul Jacobi, of Wadhams Oil Company. Buckley, Crawford said, was loaned by his company to the independent refiners as liasion man to make the plan operate, while Cline, as executive secretary and manager of the East Texas refiners group, distributed buying orders from the majors after advising Buckley how much gas was available for purchase from time to time "in order to keep the market rigged." In the Mid-Continent area, a program different in operation but identical in principle, was conducted with Jacobi as contact man.

Crawford discussed at some length the part independent marketers play in distribution of gasoline, declaring that approximately 50 percent of the 4,500,000,000 to 5,000,000,000 gallons of gasoline sold annually in the ten mid-western states, termed "Standard of Indiana" territory, was handled through approximately 4000 marketers. It was this group, he said, that "suffered most" by the alleged conspiracy, explaining that prices the marketers paid to major companies were based on the spot market prices paid independent refiners who controlled "only 5 percent" of the output. He charged that majors wanted to drive the marketers from the picture.

"By raising the price of the 5 percent," Crawford said, "they raised the price of the 85 percent. The conspiracy charges them with doing just that. There was no written agreement as to a violation of law. They did it in the dark and secretly."

He said the jurors should not expect the government to bring written proof of the alleged conspiracy.

"The picture that will be unfolded here by witnesses and documents from the oil companies," he added, "is a picture of just how the master mind in this conspiracy sowed the seed in other minds and raised the price of the spot market. This enabled them to charge what they pleased. This was reflected in the retail market."

He said the first step was organization of independent refiners and appointment of liasion men to work between the major oil companies and the refiners.

"It was the perfect monopoly," he charged. "They took control of the market until they were indicted by the grand jury here. They could make us pay what they wished. The jobbers were driven to the wall and were forced to pass it on to the consumer. Secret meetings were held in Chicago, Washington, New York, St. Louis and Tulsa. The scheme was hatched and men selected to put it over."

Cites Half-Cent Price Raise

Chaffetz, continuing the government's opening statement, attributed the upward trend in the price of gasoline directly to the alleged conspiracy. He claimed there was no justification for a half-cent boost in the retail price during January, 1936, a severe month when motor traffic was light. He charged it was done arbitrarily by secret agreement among the major companies on the basis of a raise in the crude oil price which, in turn, was based upon a previous artificially-raised retail price.

"The majors tampered with that supposedly free and open tank car spot market to enrich themselves at the expense of thousands of jobbers and millions of gasoline users in the Middle Western states," he said. "Don't let yourselves be led to believe," he told the jury, "that all these defendants did was to buy some surplus gasoline that was lying around because there was no use for it. They did not content themselves with merely buying surplus gasoline—and this goes to the very basis of their claim to honest purpose—they bought as much gasoline only as was necessary to establish the price they wanted. They had no right under the law to affect that surplus one iota."

Before the trial opened, Judge Stone denied a plea filed a week ago in behalf of Bernard L. Majewski, Chicago, vice president of Deep Rock Oil Company, asking to be tried with other defendants. Declaring that the government has not yet decided whether it would call Majewski, who is covered by the indictment now being tried, whether it would call him as a witness, or as a defendant at some future date, J. E. Lumbard, his attorney, told the court:

"Majewski has been under indictment for about 14 months and has a constitutional right to know whether he will be called as a witness or a defendant and is entitled to an early and speedy trial. Majewski waived removal proceedings. He has also gained immunity by testifying before the grand jury as a witness for the government. We will waive a jury trial so that a decision could be reached today and not delay the opening of the trials of other defendants."

The contention that the prosecution has the right to determine when the various defendants are to be brought to trial and whether they will be tried separately or jointly, made by John Lewin of government counsel, was upheld by the court. Lewin said there were many reasons why the government wishes to have a separate trial for Majewski. "Mr. Majewski was notified in July that he would be called to trial but he joined with other defendants to have the trial date postponed until this fall," Lewin said. "The question should be left to the discretion of the prosecution without interference by the court."

Legislative Affairs

Omnibus tax bill providing for nearly 46 percent hike in natural resources levy is approved by Texas House committee despite pleadings of oil concerns.

LAST week the Texas House Committee on Revenue and Taxation passed out of committee the Omnibus Tax Bill described in THE OIL WEEKLY of October 4. This bill provides for an increase of about 46 percent on natural resources and certain utilities. The raise applies to crude oil, natural gas, carbon black and cement.

During the course of hearings, some 10 representatives of the oil and gas industries appeared to protest against the increase. The oil company protests centered largely around a plea from operators in North Texas, West Central Texas and the Panhandle that stripper wells in these areas must be abandoned if operating costs are increased through higher taxes.

The burden of this argument was that the Federal government had found that the average lifting costs for stripper wells was $1.10 per barrel and the operators pointed out that they received $1.12 or less for the oil they produced.

One-Third from East Texas

Probably the most interesting argument was advanced by J. S. Hudnall, Tyler geologist, who told the commission that the East Texas field would be called upon to pay $3,000,000 of the $10,000,000 increase which the legislature proposed to exact. Hudnall said that $630,000 would be paid by royalty owners, $1,000,000 by major operators and the remainder of the $3,000,000 would come from independent operators producing in the field.

No sooner was the bill presented on the floor, than efforts were made to recommit the measure under provisions of a resolution which pointed out that the bill was so drawn that it could not be amended to increase old age pensions. Late in the week proponents of this resolution seemed to gain strength, and it appeared that the bill might go back to the committee for further changes.

New Pipe Line Bill

Another bill which came out of the committee is intended to increase the taxes on Texas pipe lines. Representative John Bell of Cuero introduced the bill drawn by the State Tax Commission which would levy an occupation tax of 3½ percent of the net income of pipe lines.

The bill provided that net income from the transportation of petroleum or its derivatives shall be deemed to include all the revenue derived from the transportation and loading on vessels of crude oil as well as the rentals from leases of pipe line property. The only deduction would be the ordinary and necessary expenses incurred as operating revenues.

The bill provided penalties ranging from $1,000 to $5,000 for failure to report, 25 percent penalty for failure to pay the tax when due. Both taxes and penalties which are delinquent bear 6 percent interest. The entire income would go to the general revenue fund.

The Senate, however, injected a new angle into the legislative picture by fostering the introduction of a bill which would reduce departmental appropriations $3,000,000 a year.

Lieutenant Governor Walter Woodul ruled that the bill did not come with the governor's call, but members sustained an appeal in the decision by a vote of 18 to 8. The bill was written by Senator Grady Woodruff of Decatur, who contended that the governor's call for the special session automatically submitted the subject of appropriations since it is impossible to vote new taxes without allotting the prospective income to funds, which would in turn constitute direct appropriations.

The fact that the Senate overruled the chair was regarded as most significant since this action has not been taken by the Senate for several years.

Proration Matters

Additional increases in Texas allowable boost it 22,554 barrels daily original October quota.

ANOTHER upward adjustment in the October production allowable for Texas, and the start of a survey to determine the number of wells in Texas incapable of producing the allowables assigned them, were the most important proration matters of the week. A number of minor activities completed such work.

Texas allowables raised

The Texas Railroad Commission last week began its adjustment of allowables in various Texas fields, ordering increases, all of which were retroactive to October 1.

The Tom O'Connor field was raised 2000 barrels to 14,998 barrels. In West Texas, North Cowden was increased 593 barrels to 7800 barrels. The Gulf McElroy field was increased 789 barrels to 4532 barrels. Penwell was raised 443 barrels to 4090 barrels and the Taylor-Link field was increased 141 barrels to 172 barrels.

The Ezzell field in McMullen County was increased 153 barrels to 455 barrels, resulting in a top allowable of 85 barrels per well. The allowable for the O'Hern field has been increased 1710 barrels to 7910 barrels daily.

Numerous adjustments have been made in other fields, and a re-check of the Texas allowable late in the week showed that the state total effective October 1 was 1,427,767 barrels daily, a total raise of 22,554 barrels above the allowable fixed by the commission's order for October which was issued on September 21.

Texas dead well check

Last week the Texas Railroad Commission had begun its investigation to determine whether there are some wells in Texas incapable of producing the allowables assigned to them.

Commissioner Ernest O. Thompson announced that the survey would begin in East Texas and would be extended to all other fields as rapidly as men became available to handle the job.

The commission issued an order intended to aid in preventing the operators from making up the allowable for one well from other wells producing in the same tank.

The new order applies to every oil well in Texas and provides that the installation shall be completed by October 15, as indicated below:

"Therefore, be it ordered by the Railroad Commission of Texas that effective October 15, 1935, all flow lines leading from individual wells, whether pumping or flowing, and where two or more wells are flowing or pumping through a common line or into a common battery, shall be equipped with a check valve in good working order. Such check valve shall be above the ground and placed in the flow line as close to the well head connection as practicable, and in no event shall be further from the Christmas Tree than 12 feet. The check valve shall be placed in the line so as to permit passage of oil from the well and act as a check to any fluid that might enter the well through the line from outside sources. A valve or other means of shut-off shall be placed in the flow line immediately beyond the check valve and between the check valve and the tank battery in order that the back pressure on the line may be cut off and the check valve examined at any time."

Well basis for Fitts

Wells in the Fitts field in Oklahoma will produce on a well basis for the month of October, despite the fact operators there recommended lease basis production, according to a letter issued last week by W. J. Armstrong, con-

servation officer of the Oklahoma Corporation Commission. The decision resulted when operators in the field, after holding several conferences, failed to agree on a definite program.

The letter, written to Hugh Thomas, deputy conservation officer, instructed him to see that production in the field was run on the well basis. If operators reach a decision and the field is produced on a lease basis, separate tanks and lines as well as separators must be set up for each well producing from a given zone. If field basis is decided upon, the letter states, ". . . all the wells on a given lease will be produced in a common tankage, then the allowable will be added up for all the wells of any said lease and totaled; that will be the total allowable for that given lease and the purchasers would report in that manner. A separate treating system for each zone would not have to be set up."

Texas hearings

The Texas Railroad Commission has postponed until November 2 its hearing on the Aransas field, Aransas County, which was scheduled for October 8. On October 19, the commission will hold a hearing at Austin to determine whether its rule regulating disposition of tank bottoms should be altered. This rule, which provides that 75 percent of the oil recovered from tank bottoms shall be charged against the well allowable, was recently enjoined in federal court.

The monthly statewide proration hearing will be held in Austin on October 20, and on October 28 a hearing on the Old Ocean field, Brazoria County, will be held. The latter hearing will involve the spacing, drilling, operation and method of allocation for wells in this field.

Twenty-acre spacing was advocated for the Webster or Friendswood field, Harris County, at a hearing before the Texas Railroad Commission last week. V. H. Borsodi, the only operator in the field besides Humble Oil & Refining Company who has a producing well, expressed the opinion that development was insufficient to determine proper regulations, but he declined to object to the 20-acre spacing rule.

Humble Oil & Refining Company asked that the commission require a thousand feet of surface casing cemented to the surface and an oil string set at the top of the sand and cemented 1000 feet above the shoe. A maximum gas-oil ratio of 2000/1 was recommended.

Humble Oil & Refining Company outlined the physical conditions in the field through testimony presented by Douglas Bell, geologist, T. V. Moore, production research engineer, and W. E. Hubbard, production engineer.

It was estimated that the probable productive area of the field will include 6000 acres. Bell explained that wells drilled north of the Humble producers found nothing but salt water in the Frio sand. He pointed out that the McCarthy well south of the Humble producers also encountered salt water which bounded the field in that direction. Bell expressed the opinion that there is probably a fault through the field running from the intersection of the Galveston County line with Clear Creek through the southeast corner of the George Dedrick Survey.

Oil at Conventions

Oil exposition, Independent Petroleum Association and geological and engineering meetings to feature this week . . . A. I. M. E. headlined past week.

THE past week was featured by the American Institute of Mining and Metallurgical Engineers convention in Oklahoma City, while the coming week is head-lined by the Oil-World Exposition in Houston, and several meetings that will be held in conjunction with it. Included in the latter is the annual meeting of the Independent Petroleum Association of American, the Interstate Oil Compact Commission, the American Society of Mechanical Engineers and a number of technical sessions sponsored by the exposition.

I. P. A. A. meeting will attract a large group

Oil and political celebrities from all over the United States will attend the Independent Petroleum Association of America's convention at Houston October 14-16, as a feature of the Houston Oil Show.

Heading the visitors will be Secretary of Interior Harold F. Ickes from Washington, who will arrive at 8:55 a. m. October 15, and who will speak at the I.P.A.A. banquet that night, and then take a train later for return to Washington. During the day he spends here, Secretary Ickes will be escorted through the Oil Show by President John R. Suman of Oil-World Exposition.

Heads of 10 of the nation's leading oil and gas associations will be in Houston for the Ickes speech, the convention and the meeting of the Interstate Oil Compact Commission.

Tickets for the banquet, which will be in the Rice Hotel ballroom Friday night, will go on sale Saturday at the executive offices of the Oil Show in Houston's big new Coliseum, at the Rice Hotel, and at the Hughes Tool Company. When the oil show opens Monday, tickets also will be sold at Gulf Publishing Company's booth.

The Interstate Compact Commission meeting will bring 30 representatives from nine states, Elwood Fouts, chairman of the committee handling local arrangements, announced Thursday.

Governor E. W. Marland of Oklahoma will head the largest delegation, his state contributing 12. Kansas will send 6, New Mexico, four; Colorado, two, Indiana, two, and Illinois, California, Pennsylvania, and Louisiana one each. The Texas delegation will give a representation of 10 states at the meeting. The governors of each of these states, or their personal representatives, will represent each state.

Heads of the various oil societies who have already signified they would attend the meeting are Axtell J. Byles and W. R. Boyd, Jr., president and executive vice president, respectively, of the American Petroleum Institute, N. C. McGowen, president of the American Gas Association, J. D. Collette of Fort Worth, president of the Mid-Continent Oil & Gas Association, Jake Hamon of Dallas, president of the Mid-Continent Oil & Gas Association of Texas, R. L. Wheelock of Corsicana, president of the Texas Petroleum Council, R. L. Underwood of Wichita Falls, president of the North Texas Oil & Gas Association, J. C. Hunter of Abilene, president of the West Central Texas Oil & Gas Association, R. S. Kerr, of Oklahoma City, president of the Mid-Continent Oil & Gas Association of Oklahoma and Kansas, William Bell of Robinson, Ill., president of the Illinois Oil & Gas Association, and Rush Blodgett of Los Angeles, vice president of Oil Producers Agency of California.

A Tyler group of I.P.A.A. members Thursday wired Houstonians arranging the convention that they would send 200 dozen roses for the banquet at which Ickes is to speak.

A. S. M. E. program for meeting at Houston

In connection with the Oil Show and several technical meetings, the American Society of Mechanical Engineers is taking advantage of the coming together of the greatest aggregation of engineers in the Southwest this year by also having a Petroleum Division meeting.

This meeting, Tuesday, October 12, in the Coliseum, is a joint meeting with exposition drilling committee, and the A. S. M. E. representatives have prepared four excellent papers.

The first paper to be presented will be by Professor E. E. Ambrosious, of the University of Oklahoma, at 10 a. m., and is titled, "Progress Report on Fluid Meters Research." These tests, sponsored by A.S.M.E., have been going on for some four years. So important are they that the United States Bureau of Standards asks for daily reports, and every six week, Howard Bean of the United States Bureau of Standards comes to Norman to confer with Professor Ambrosious. The findings will have far reaching effects on the measurements of oil in the industry.

At 10:30 a. m., Nathan Janco, research engineer with Reed Roller Bit Company, will present a paper on rotary engines. This paper should prove extremely interesting.

The exposition drilling committee will present four papers at that meeting, namely: "Historical Review of Production Experience on Deviated Wells," by H. John Eastman; "Oriented Coring," by A. B. Patterson and J. K. Butler, The Texas Company; under "Well Surveying Methods," papers on "Oriented Survey," by N. L. Doon, Lane-Well Company; "Gyroscopic Sur-

veys," by R. S. Hyer, Sperry-Sun Company; "Magnetic Surveys," by James K. Hughes, Eastman Oil Well Survey Company; and "Technique of Controlled Drilling," by Douglas Ragland, Humble Oil & Refining Company.

At 3 p. m., A.S.M.E. will present "Sulphate Resisting Cement," by Sven Rordam of Trinity Portland Cement Company, who has developed a cement for use in oil wells in contact with brine, and at 3:30 p.m., "Trend in Casing Head Gasoline Plants," by Frank Noble, Humble Oil & Refining Company, describing the development of the modern plant and where it fits today.

These eight papers prepared by authorities in their lines, make a line-up that engineers can spend a profitable day attending.

Interesting technical papers at A. I. M. E.

The Fall meeting of the Petroleum Division of the American Institute of Mining and Metallurgical Engineers, convened in Oklahoma City Thursday, October 7, for a three-day program.

The local committee with W. H. Carson, general chairman, Hubert E. Bale, C. C. Robins, Earl Oliver, H. F. Beardmore, Jerry B. Newby, C. H. Keplinger, Richard W. Camp, W. H. Steuve, Don R. Knowlton and R. L. Huntington, assisting as meetings, registration, publicity, entertainment and field trips chairmen respectively, called the first session to order at 10:00 A. M., following a breakfast of officers and authors.

Testing Oil Sands

M. Albertson, division general chairman, presided and called for the first paper, "Methods of Testing Oil Sands," by W. J. Murray of the University of Texas.

This paper reviewed briefly the past progress in developing the study of subsurface accumulations in strata reservoirs, and determinations of the oil, gas and water contents; or more exactly, the degree of presence of the three within the same structural condition. He outlined the recent advances in the science and pointed out that the present trend is toward more analytical core analysis and interpretation. Of particular interest he called attention to the presence of connate water in quantities not expected prior to core analysis practice.

Gas-Oil Contacts

"Gas Caps and Methods of Determining Gas-Oil Contacts," was the title of the second paper, presented by P. P. Gregory, chairman of the Yates Pool Committee. In brief, his paper referred to the relation of gas caps to producing structures during various stages of exploitation or development, and means of establishing the existence and extent of a gas cap prior to actual definition through drilling. He prefaced mathematical means of making gas cap determinations by a description of the general conditions existing within oil bearing reservoirs. It was pointed out that gas either existed as free gas lying above the oil by reason of its lesser density, or it was intimately mixed in solution with the crude, or both. Gregory defined the critical saturation pressure, and showed that a reduction below such a point would increase the volume of free gas by allowing a portion to come out of solution with the oil, and in this manner increase the size of the gas cap.

Conversely, pressure added to reservoirs has been known to effectively reduce the volumetric size of gas caps by driving gas into solution with the crude.

Emphasizing the importance of knowledge of gas cap conditions, he explained a simple method to establish the oil-gas contact. The factors used in the calculation are: first, structural data such as depths, elevations, etc.; reservoir pressures, tubing and casing pressures, static oil pressure gradient taken at two depths within the oil and calculated by a comparison of the two derivations, and last, the gas pressure gradient obtainable at the well head. He explained that practical applications had proven the adaptability of the method of computation.

Knowledge of gas caps is particularly desirable when drilling through a gas cap into production below a gas-oil contact. Gas cap knowledge is essential in evaluation of oil properties, and production engineering can be based largely upon gas cap movement with crude production and pressure release.

Pressure Distribution

"Pressure Distribution in Producing Oil and Gas Reservoirs," was the title of a presentation by A. J. Miles of the Missouri School of Mines and Metallurgy, and Eugene A. Stephenson, University of Kansas. An anology was shown to exist between a deflective membrane consisting of bubble surface produced chiefly by water and glycerin, and the pressure drop in a producing field. It was shown that the drop followed the same gradient, and was considered a new technique in this important study. It was considered particularly adaptable to flowing single phase fluids.

Production Economics

W. E. Hubbard, Houston, spoke on "Economic Trend in Production," showing that today the industry has approximately $6,000,000,000 invested in producing equipment and drilled wells, and that the return on this investment is far below the 4½ percent return confidently expected by other business. He showed that production to the present had been about 19½ billion barrels, and that the average gross return was in the neighborhood of $1.20 per barrel. Of this amount the producer immediately must consider the royalty which reduces the value of each barrel by 12½ percent.

Pointing out the necessity for greater economy, Hubbard singled drilling and equipping of new wells the most important single item of expense, and the one division in which saving might most readily be made. In this respect, it was noted that wider spacing was a possible method that might be employed to effect a saving, and it was added that this would also be a conservative measure as from present indications, reservoir pressure, or production energy, drops less per barrel of recovery with wide spacing than with close spacing in the ratio of approximately 3 to 1, the same volume of production being considered.

Spacing of Wells

L. L. Foley, Tulsa, followed Hubbard's talk with "Spacing of Oil Wells," a careful and exhaustive examination into the question of adequate spacing. In addition to presenting important data on effects of varied spacing on production and reservoir energy, Foley made concrete suggestions as to means of arriving at new and basic methods of determining well density on an engineering and economic basis. His talk concluded the morning session.

Origin of Petroleum

The second division of the program was started by E. Berl, Carnegie Institute of Technology, delivering a paper based upon the results of ten years research by himself and associates. The title of the presentation was "Origin of Petroleum." As a result of laboratory experiments, Berl obtained data to lead to the conclusion that oil, gas and coal are closely associated in formation, and

TO HONOR FOREIGNERS

Mr. and Mrs. Ray W. Smith of Houston will give a reception and barbecue honoring visitors from foreign countries attending the Oil-World Exposition at their estate, Tall Timbers Lodge, on San Felipe Road, on Tuesday evening from four to six. Wives of visitors from foreign countries also have a cordial invitation to enjoy the hospitality of Mr. and Mrs. Smith.

Visitors who wish to avail themselves of this hopitality may leave their names and hotel addresses at the Gulf Publishing Company's booth in the main Coliseum Building.

I.P.A. BANQUET TICKETS

The Independent Petroleum Association's Annual Banquet to be given at the Rice Hotel Friday evening at 7:00 o'clock, will be one of the outstanding events in connection with the Oil-World Exposition week in Houston.

It will be a combination of the Independent Oil Men's Annual Banquet and the famous "Wyoming wild game dinner" which has been a popular invitation affair in Houston for the past several years. Elk and moose meat, the result of the hunting prowess of more than 20 oil men who annually go to Wyoming on a big game hunt, will appear on the menu.

Tickets sell for $5.00 each except for members of the I. P. A. to whom tickets will be sold for half price. Tickets for the banquet may be had by applying at the Independent Petroleum Association's headquarters in the Rice Hotel or at the Gulf Publishing Company's exhibit in the main Coliseum Building where only tickets to non-members will be sold.

that land plants, sea weeds and algae are largely responsible. Through various reactions dependent upon heat, chemical changes, etc., it has been established that carbohydrates and substances that have a composition similar to carbohydrates, like pectin acids, algin acids, and cellulose humic acids, may be formed. Berl showed that it was possible to convert carbohydrates into liquid hydrocarbons so that somewhat less than 50 percent of the carbon present in the carbohydrates can be transformed into crude oil materials.

Connate Water

"Connate Water in Oil Sands," by R. J. Schilthuis, Humble Oil & Refining Company, was unusually interesting to the assembly, and occasioned much favorable comment.

Schilthuis showed that electrical logs taken on wells had for a long time indicated the presence of considerable volumes of water present, and that subsequent core examination proved the indicated presence. He explained the existence of connate water by stating that it might have been trapped when the strata were formed at the boom of a salt sea. In such a manner the salt water could readily still be contained within the rock.

In the accumulation of the crude in natural reservoirs capable of sustaining the oil, the crude displaced the water within the pores of the sand. However, it was indicated that the water could not displace all the water present, that a certain portion was held captive within enclosed pores or pores having no continuous linkage, and that therefore these water particles were not subject to the intrusion of the crude. Another factor of importance was the increase of strength of water with decrease in size of apertures in which the water is present, this influencing the volume of water displaceable by crude.

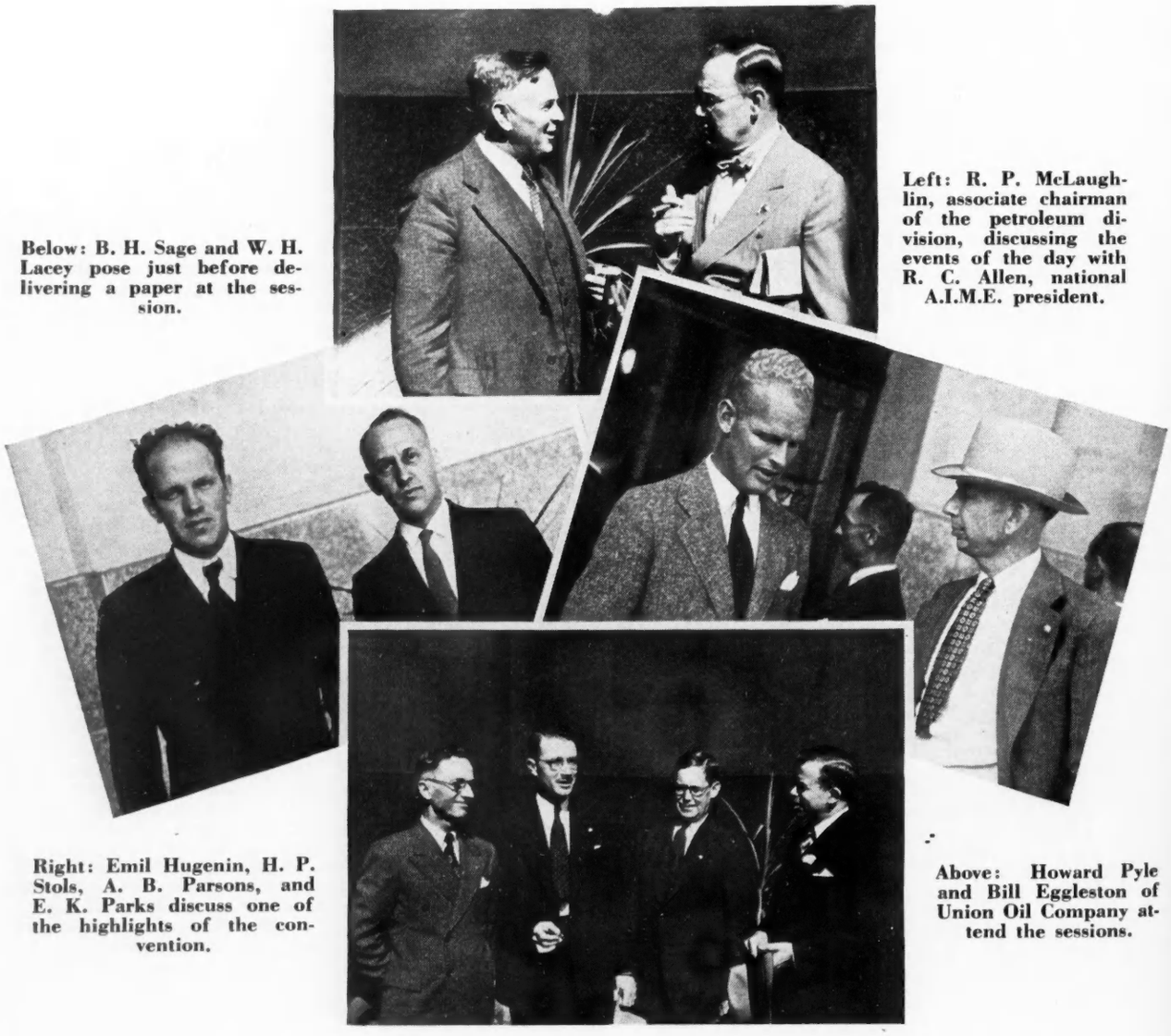
The author remarked that the mere fact that production was free of water, it was not indicated that no water was present in the reservoir strata, as the reverse of this had been found to be true in at least some cases. Due to the presence of connate water, the water-oil contact is not the definite line previously considered, but might be only relative to water volumes. The speaker noted the difficulty in obtaining suitable core samples for analysis. He mentioned and explained the results of specific tests in East Texas field, and in Tomball and Anahuac, and showed that the water present in each was different in connation. He closed by indicating the increased importance of the subject to production engineering, water flooding and general field practices.

Salinity of Water

"The Salinity of Waters in Buried Sediments" was given by Paul Weaver. The paper presented the findings of a number of fields and showed the variable differences of salinity of water produced with crude oils. It was indicated that through reactions, precipitation might result in the strata area around the production zone. In other cases it was questioned as to exactly how much salt was carried by the produced crude in the form of crystals. If so, and there were reasons for considering the assumption, then it was prob-

[*Continued on page 276*]

At the Petroleum Division Meeting of A. I. M. E. in Los Angeles



Below: B. H. Sage and W. H. Lacey pose just before delivering a paper at the session.

Left: R. P. McLaughlin, associate chairman of the petroleum division, discussing the events of the day with R. C. Allen, national A.I.M.E. president.

Right: Emil Hugenin, H. P. Stols, A. B. Parsons, and E. K. Parks discuss one of the highlights of the convention.

Above: Howard Pyle and Bill Eggleston of Union Oil Company attend the sessions.

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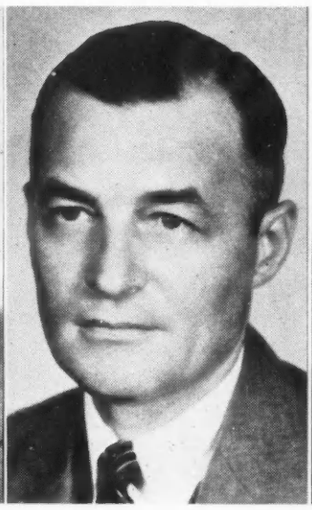

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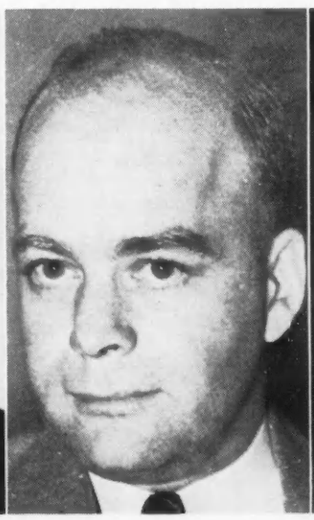

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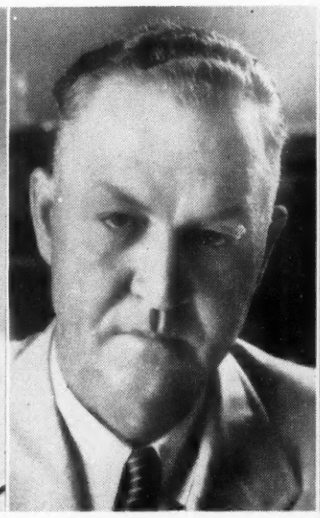

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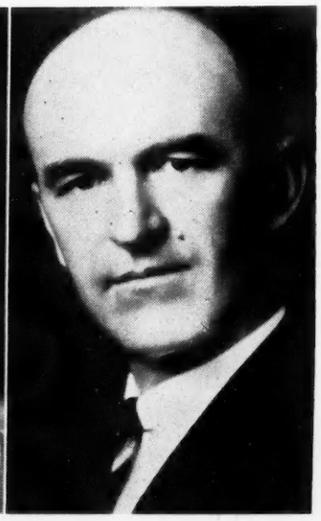

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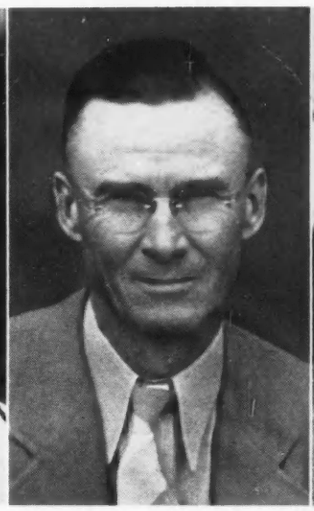

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Heat Utilization in Dehydrator Plant

By R. W. FRENCH
Continental Oil Company

THE heating of crude oil emulsions during treatment to reduce water content is very common, particularly in central plants. Many types of heat source are now in use with converted fire-box boilers, tubular boiler heaters, small vertical boiler heaters, and various waste-heat exchangers supplanting the use of high-pressure live steam with its low efficiency and attendant high cost.[1] The direct-fired pipe still type heater with relatively high efficiency may provide an economical source of heat for a central plant whose throughput is large and whose probable life will be long enough to realize the full benefit of operating savings.

Usual dehydrator plant operation provides a flow of hot clean oil, hot waste water, and often exhaust steam from circulating pumps, accompanying the flow of emulsion. From a thermal viewpoint the heat content of the first three fluids may be thought of as by-products whose value is lost unless proper heat exchange equipment is installed to utilize them. Also, with few exceptions, it is desirable that the clean crude oil run to field storage at the lowest practicable temperature to minimize evaporation with its corollary volume and gravity loss. Hence, the installation of heat exchange equipment, by taking advantage of this favorable situation, may yield considerable fuel saving as well as over-all operating economy.

THE necessity for heating most crude oil emulsions during treatment to meet pipe line specifications provides a profitable setting for the application of efficient heat exchange equipment. Centering about the use of a direct gas-fired heater of the pipe still type, the proper exchange of heat between emulsion, waste water, clean oil, exhaust steam, and cooling water may achieve considerable fuel economy as well as efficient operation.

Presented before the fall meeting of the Petroleum Division of the American Institute of Mining and Metallurgical Engineers, Los Angeles, Calif., October 1, 1937.

Installation Description

The plant used as an illustration herein was reconstructed from an older- live-steam plant which had been in use for 10 years. Although much of the older equipment was necessarily retained, the construction of a direct-fired pipe still type heater was followed by the installation of fairly complete heat exchange equipment and controls. Because a turbine-driven water pump used for lease emergency and fire service required the use of one boiler in service, and the former steam pumps were capable of serving the new plant, two boilers of the original four were included in the new plant. The exhaust steam from the pumps serves to raise the temperature of the emulsion entering the heater. Of course, in a completely new plant without external steam requirements the pumping might advantageously be accomplished by electrical, or internal-combustion prime movers with the tube type heater furnishing all primary heat.

Plant Capacity

Although the present daily volume of clean oil dehydrated averages approximately 3500 barrels, the plant normal capacity is 4500 barrels, and amounts as high as 7000 barrels have been handled. The average water content of the emulsion furnished the plant is 50 percent, but this quantity is reduced more than half by the settling action which takes place in the supply and decanting tank, and gun barrel. Wet gravities of gun barrel discharge range ordinarily from 16 to 24 degrees API, with clean oil averaging 27 degrees A.P.I.

Plant Layout

As shown in Figure 1, the plant is laid out in a compact manner to minimize piping expense and upkeep, and to facilitate operation. The supply tank, gun barrel, pump house, heat exchangers, heater, and treaters may be identified easily. All piping except the steam lines is in concrete trenches covered with subway grating, and insulation is provided wherever desirable. Automatic control and recording devices are in general use, including pressure regulators on plant pumps, stroke counter on recirculating pump, liquid-level controllers on treaters, thermostatic control on heater fuel, back-pressure regulator on treater discharge main, and various recording temperature and pressure gauges.

Heating Sequence

Movement of the fluids involved through the plant is shown in the schematic flow diagram, Figure 2. From the supply tank the crude oil emulsion is pumped through the first pair of heat exchangers which utilize the heat content of the waste water efflux from the treaters. As the emulsion proceeds through the gun barrel some waste water is freed by the action of the

FIGURE 1
Central Dehydrator Plant Employing Direct-Fired Heater.

heat and chemical injection. The circulating pump then forces the emulsion through a heat exchanger which makes use of the heat in the clean oil from the treaters. The lowering of the temperature of the clean oil is also important since it decreases the size of exchanger and volume of cooling water necessary in the final unit which reduces the clean oil to proper shipping temperature. In some installations this would mean corresponding decreases in the cost of cooling towers and pumping equipment.

Immediately following the clean oil exchanger are two exchangers serving to transfer the latent heat of the pump exhaust steam to the emulsion. By this time the emulsion has reached a temperature close to 150° F., which is increased to around 177 in the heater. Thermostatic temperature control operates to fire the heater at rates which will maintain constant the proper temperature for treater intake. After the emulsion has proceeded through the first four treaters, the cleaned oil passes through the two re-run treaters which reduce the water content from around one and three quarters percent to one-half of one percent. From these treaters the clean oil runs to the shipping tanks after giving up its excess heat in the clean oil exchanger and cold water exchanger respectively. A recirculating pump maintains movement of some clean oil from the treaters back into the intake of the first run treaters. This procedure was found necessary to maintain optimum treater functioning.

Heater Data

The direct gas-fired heater used in this plant is of the tube still type familiar to refinery practice. Constructed of salvaged drill pipe and boiler flues in a steel and brick setting, its cost was slightly more than one-quarter of that necessary to install live-steam equipment to accomplish the same heating. A pressure-relief valve provides protection against emergencies; the sloping furnace floor is equipped with a drain line and trap in case of tube failure; a water line is connected to the inlet so that the coils may be protected in case of circulation failure; and a steam line is connected to the furnace to smother fire if necessary.

The heater was designed to supply 1,500,000 Btu per hour at conservative ratings, but has yielded over 2,000,000 without difficulty on occa-

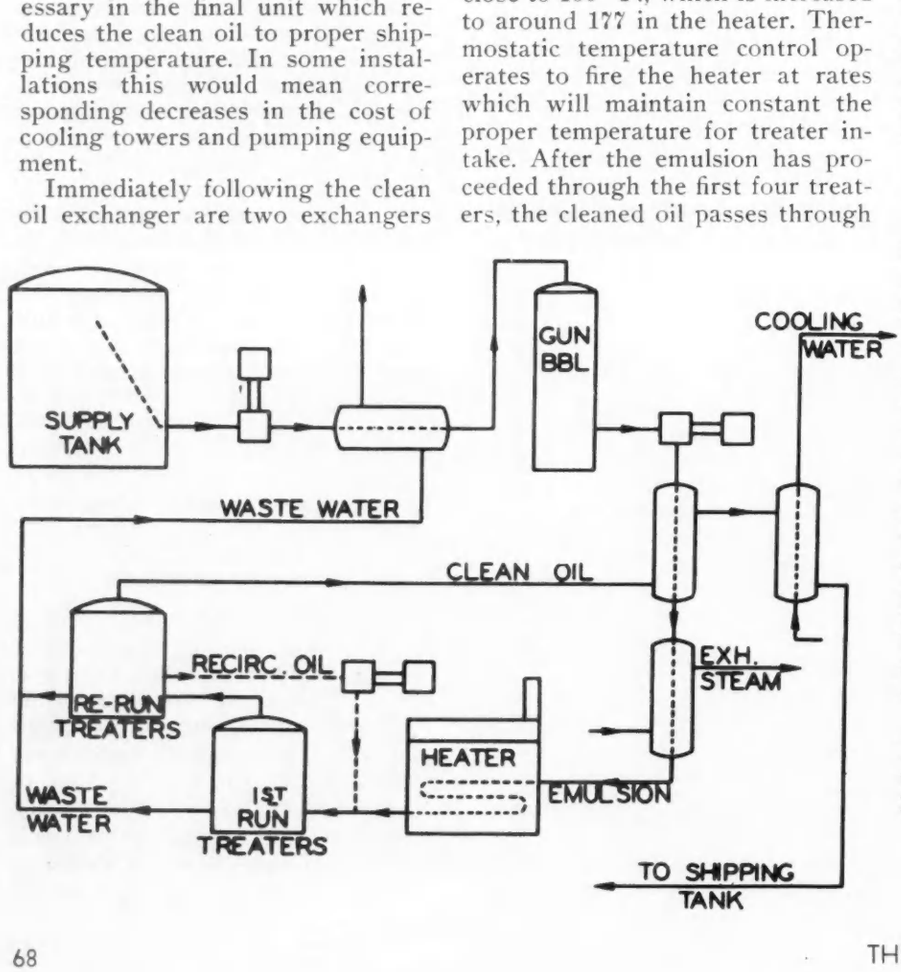


FIGURE 2
Schematic Flow Diagram.

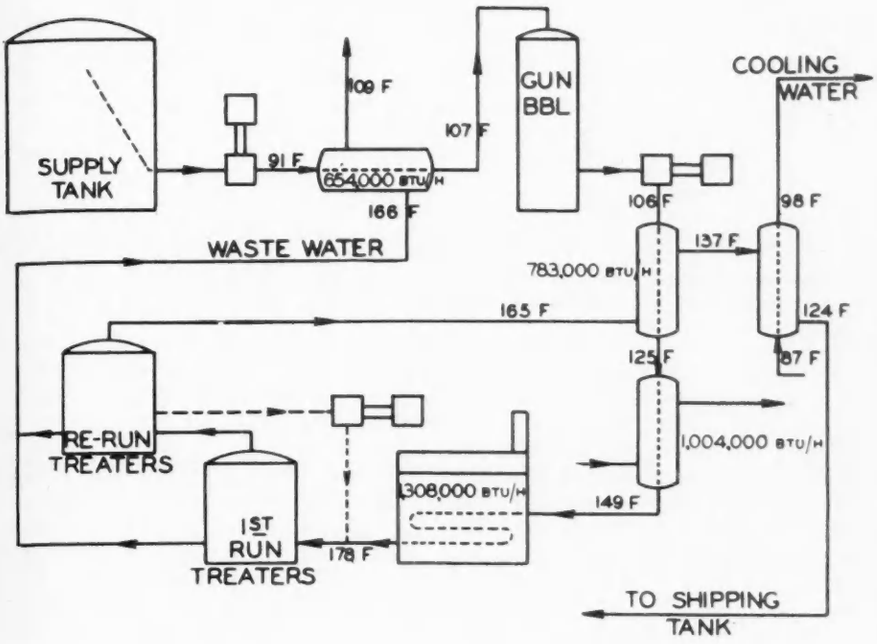


FIGURE 3
Typical Flow Sheet showing heat supplied to Emulsion.

sion. Maximum heat intensity seldom exceeds 10,000 Btu per square foot of heating surface, and the pressure drop through the heater at peak loads reaches 30 pounds per square inch. Heater efficiency as illustrated by Figure 4 varies from 70 to 78 percent in the operating range. An incidental feature of this type heat source is that emulsion temperatures necessary for proper treater functioning may be from 10° to 15° below those of live-steam plants as a result of the constant temperature maintained by this single, controlled source. A comparison of costs between this direct-fired heat source and a minimum-cost live steam installation yields very significant results. Total installed costs per million Btu of output are $845 in the case of the direct-fired heater contrasted with $3150 for the live-steam equipment with fuel costs, on the basis of millions of Btu per hour output, of 6 and 21 cents respectively. These savings in a direct-heat plant of the size under consideration are equivalent to an installation economy of $5180 and an annual decrease in fuel expense of $1840. Maintenance costs, also, on the direct-heat unit should be much lower.

Heat Balance

Continuous-flow heat exchangers or recuperators of the counter-flow type are used in the plant discussed above to conserve and convert to useful purpose the economically available waste heat of various fluids. As shown by the typical flow chart in Figure 3 a total of 2,441,000 Btu per hour or 65 percent of the total heat supplied to the emulsion is contributed by these exchangers. Of this amount, 27 percent is yielded by the waste water efflux, 32 percent comes from the preliminary cooling of the cleaned oil, and the remaining 41 percent is furnished by the condensing of exhaust steam which is then available as boiler feed water. Of course, these proportions vary with changes in emulsion throughput and composition, but in general their total remains a fairly constant proportion of the entire heat supplied the emulsion. If the exhaust steam were not available here, the other heat exchangers would supply about 40 percent of the necessary heat, and it might then prove economically justifiable to take further advantage of the residue waste heat in the outgoing clean oil. Over-all heat distribution for the entire plant is summarized in the subsequent table and emphasizes, from a thermal viewpoint, the disproportionate amount of plant fuel required by the boiler.

Heat Exchanger Calculations

In considering an installation of heat exchange equipment some of the factors of importance are: throughput or velocity of fluids; gravity and water content of emulsion; entrance and exit temperatures given or desired for both fluids; probable values of the mean transmittance or heat transfer coefficient; area of heating surface; pressure losses; and effect of any corrosive influence. Of course, the throughput rates are usually established and with the fluid characteristics indicate the limits of size so far as pressure loss is concerned. Probable effective values of the heat transfer coefficient may be assumed from experience or obtained from the manufacturer who may also furnish data on temperature ranges and fluid velocity as well as pressure loss and corrosion effects. Since an infinite amount of heating surface would be required to utilize all the heat available, it is obvious that the economical amount to install is determined by consideration of the actual value per unit heat output in each instance.

Since calculations of heat transfer involving the inter-relation of temperatures, velocities, surface areas, and variations in the heat transfer

Plant Heat Balance

		Btu/h	Percent
Total Heat Value of Plant Fuel		5,220,000	100.0
A—Boiler Input:			
1. Heat used in pumping plus steam exchanger and radiation losses		1,251,000	24.0
2. Heat transferred through exhaust steam to emulsion		1,004,000	19.2
3. Boiler losses		1,270,000	24.3
Total		3,525,000	
B—Heater Input:			
1. Heat transferred to emulsion		1,308,000	25.1
2. Heater losses		387,000	7.4
Total		1,695,000	
C—Heat Balance of Fluids:			
1. Heat input (A, 2 plus B, 1 above)		2,312,000	
2. Heat lost in discharge:			
Clean Oil	928,000		
Cooling water	423,000		
Waste water	240,000		
		1,591,000	
3. Heat lost by radiation and conduction		721,000	

coefficient, etc. are subject to errors of at least 10 percent, the following example will illustrate practical approximations. More exact and detailed mathematical treatment may be obtained from a study of various reference volumes.[2]

In the case of a counter-flow heat exchanger having 13,300 pounds hourly of 166° F. waste water available to use in heating 230 barrels hourly of emulsion from 91° to 107° F., how much surface will be required and what will the exit temperature of the waste water be? The emulsion is 16.5 percent water and gravity of the oil content is 27 degrees A.P.I.

Heat required to raise emulsion 1° F.

The heat required by the water phase of the emulsion will be 16.5 percent of the 230 barrels hourly multiplied by the weight in pounds per barrel and by the specific heat in British thermal units per pound as follows:

$$320 \times 0.165 \times 350 \times 1.0 = 13{,}300 \text{ Btu/h}$$

The heat required by the oil is calculated in the same manner but using weight per barrel and specific heat for 27-degree A.P.I. oil at a mean temperature of 99° F.

$$230 \times (1.0\text{-}0.165) \times 312 \times 0.458 = 27{,}500 \text{ Btu/h}$$

$$13{,}300\text{—}27{,}500 = 40{,}800 \text{ Btu/h}$$

Then the total heat required to heat the emulsion is,

$$(107\text{-}91 \times 40{,}800 = 654{,}000 \text{ Btu/h}$$

Heat lost by waste water per 1° F.

$$13{,}300 \times 1.0 = 13{,}300 \text{ Btu/h}$$

Hence, the probable temperature drop of the waste water with 100 percent effectiveness would be,

$$\frac{654{,}000}{13{,}300} = 49 \text{ F.}$$

However, since experience indicates the net effectiveness is about 85 percent,

$$\frac{49}{0.85} = 58 \text{ F.}$$

Thus, 166-58 or 108° F. will be the exit temperature of the waste water.

The mean temperature difference (Δt_m) may now be calculated by use of the following equation:

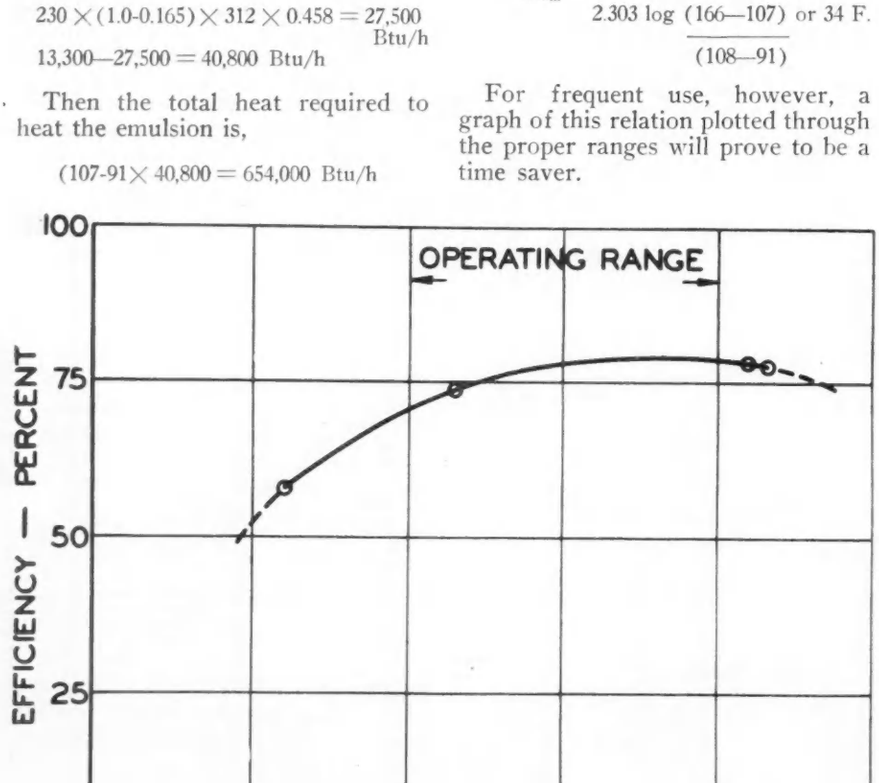
$$\Delta t_m = \frac{(T_1 - t_2) - (T_2 - t_1)}{2.303 \log \dfrac{(T_1 - t_2)}{(T_2 - t_1)}}$$

Where T_1 = entrance temperature of warmer fluid, F.
T_2 = exit temperature of warmer fluid, F.
t_1 = entrance temperature of cooler fluid, F.
t_2 = exit temperature of cooler fluid, F.

In this case:

$$\Delta t_m = \frac{(166\text{—}107 - (108\text{—}91)}{2.303 \log \dfrac{(166\text{—}107)}{(108\text{—}91)}} \text{ or } 34 \text{ F.}$$

For frequent use, however, a graph of this relation plotted through the proper ranges will prove to be a time saver.



Next, the required surface is found (using a heat transfer coefficient, K, of 25 for the type exchanger under consideration) by dividing the hourly heat supplied the emulsion by the product of the transfer coefficient and mean temperature difference.

$$\text{Area} = \frac{654{,}000}{25 \times 34} \text{ or } 770 \text{ ft}^2$$

This same relation, of course, is used to calculate the heat transfer coefficient in comparing performance results of various operating units with given surface areas.

Value of Results

Tangible improvements in operating effectiveness of the new plant under discussion are twofold. The average cut of the cleaned oil has been reduced from 1.75 to 0.5 percent. The gravity has been raised to such an extent that the average price per barrel received for all lease oil is more than eight mils higher, corresponding to a net increase in revenue of $980 monthly. And additional gravity improvement is expected to follow the early installation of facilities which will further cool the cleaned oil through the use of sea water. The economies described in the foregoing paragraphs may be summarized for the subject plant as follows:

1. Installation saving, compared to live-steam unit, of $5180.
2. Fuel economy of 49 percent.
3. Maintenance expense reduction of 5 percent.
4. Net gain from improved quality of oil of $980 monthly.

These savings acted to lower unit treating cost 10 percent, and when combined with the revenue increase will return the cost of the plant reconstruction in seventeen months.

Acknowledgements

The writer wishes to thank W. K. Kirby, consulting engineer; E. K. Parks, Standard Oil Company of California, and C. H. Smith of C. F. Braun Company for their suggestions in the preparation of this paper.

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FIGURE 4
Efficiency of Direct-Fired Heater.

The Care and Operation of Orifice Meters

Sixteenth Article of Series.

By PAT H. MILLER
Panhandle Eastern Pipe Line Company

FOR A NUMBER of years, the American Gas Association has authorized a Gas Measurement Committee to determine the correct methods of installing orifice meters for measuring natural gas. This committee published a preliminary report in 1927, which was revised in 1929, and Report No. 1 was issued in 1930. In 1931 this committee joined with the American Society of Mechanical Engineers and the joint committee aided by the U. S. Bureau of Standards published Report No. 2 in 1935.

Each of our companies is interested in orifice meter measurement. The management looks to us for accuracy. It is then our duty to famaliarize ourselves with each setting under our supervision to the extent that all features of construction, installation, condition of equipment and manner of operation are judged to meet those of accepted standards.

For the purpose of comparison, we might say that in some respects an orifice meter setting resembles a football team. The functions of the orifice gauge and other instruments are comparable to those of the backfield. The meter run and other primary equipment can be likened to the line. We might go so far as to call the operating personnel the coaching and training staff. The success of a football team depends on the cooperative efforts of every man on the team. The man carrying the ball cannot win games alone for he can only advance across ground from which the defense has been cleared by his fellow players. So it is with orifice measurement, every essential part of the orifice meter setting must function correctly if accurate measurement is to be the result. Like the football player carrying the ball, the orifice meter gauge can only record or integrate the message transmitted from primary equipment. So in the care and operation of orifice meters, it is suggested that no part of the orifice meter setting be neglected, but that each essential part be given the attention required to insure its proper function as an important part of the whole measuring device.

When first approaching an orifice meter setting, an alert meter man will not fail to make general observation of its basic construction and installation features and the general condition of the equipment. He will then proceed with a separate careful inspection or test of each essential part. His written report to the Gas Measurement Office will cover the existing facts, physical measurements and conditions so completely that the efficiency of the setting can be definitely established.

For general commercial orifice meters, the essential parts of the setting proper may be classified as follows:

Orifice Meter Gauges.
Gauge Manifold.
Pressure Tap Holes
Orifice Plates.
Orifice Flanges and Fittings.
Pipe Runs
Straightening Vanes.
Any Appurtenant Instruments.

The orifice meter gauges in general use by the natural gas industry are dependable instruments for commercial gas measurement. Such orifice meter gauges correctly installed and kept in proper working condition, will give a true account of the differential and static pressures as transmitted from the primary equipment.

Keep Gauge Level

The gauge should be set level and so maintained at all times, as each time it is thrown off level the calibration is likely to change. At each test the level should be checked and leveling adjustments made before resorting to any other means to correct for inaccuracies.

It has become standard practice with many operating companies to test and set the *differential at zero* with the *full operating pressure on the meter*. The gas pressure is made equal in both mercury chambers by equalizing through the gauge manifold bypass and closing either upstream or downstream pressure tap needle valve. If the gauge manifold is not equipped with an equalizing bypass, zero test under pressure can be made only by shutting one of the main line valves on the meter run. The procedure known as the zero friction test is a very effective means of determining whether or not the free action of the differential is being impaired by friction. To make this test, a momentary positive differential reading is created, the differential pen allowed to come to a zero rest, where it will. A momentary negative differential reading is then created and the pen again allowed to come to a zero rest, where it will. Comparison of the two observed zero positions will indicate any excessive friction.

In checking the differential against a water column, observations should be made both up and down the entire range of the chart. The indicated readings should not be influenced in any manner, as may sometimes be done by tapping the chart or jarring the gauge. Such practice may cause oversight of existing friction.

The main purpose of the *calibration adjusting mechanism* is primarily to overcome slight mechanical misalignments and after the original adjustments have been made there are few occasions for the use of the mechanism. It should never be used to offset effects that may be due to contamination or binds.

Keep Chambers Clean

Probably the most common cause of inaccuracies found in orifice meter

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gauges is a *dirty condition of the mercury and float chamber assembly.* Where meters are operated under very favorable circumstances, with clean, dry natural gas, such conditions are minimized; but, when operated under adverse circumstances, such as presented by sour gas, oily gas, or line dust, the matter of keeping the gauge clean is quite a problem.

To clean the mercury and float chamber assembly effectively, the mercury should be removed, and the assembly, including the mercury float, check valves, etc., dismantled completely to allow cleaning each part separately. Meters having solid tubing connections between mercury chambers should be turned upside down and the tubing jarred enough to cause all particles of dirt and rust to drop out. If stoppage is indicated, a small coil spring or speedometer cable is an effective tool for removing stoppage.

Unless plated or bakelite treated, the interior chamber and float assembly surfaces may be scoured with steel wool. The dust resulting from scouring should be blown out with gas pressure. All surfaces should be washed with cleaners' naphtha or high gravity white gasoline, allowed to dry, and then polished with a clean, dry white cloth. The parts are reassembled and clean mercury added in preparation for final calibration. Foul or imperfectly cleaned mercury should not be added to clean chambers or clean mercury should not be added to chambers which have been only partially or imperfectly cleaned. Every meter man charged with the care of orifice meters should have access to an ample supply of clean mercury or should have convenient means of cleaning mercury.

A convenient arrangement is to have each district meter man equipped with a complete field model mercury purifying outfit. Your program indicates that a class in methods of cleaning mercury will be held in this room immediately following this session. It may be well, however, to make several observations at this time, because of the importance of this subject.

The funnel with filter paper, chamois or cloth strainers suffices only for the removal of rust, dust or other insoluble particles, but does not effectively remove amalgams. A practical test for amalgam content may be made by placing enough of the mercury in a perfectly clean, suitable glass container to only partly cover the bottom. If by maneuvering the container, the mercury can be separated into units each having a perfect meniscus and these units can be reunited by flowing a small thread of mercury across the surface of the container, without dragging a tail, the mercury can be considered free from amalgams. Mercury which will not stand this test is unfit for use in orifice meters and should be passed through an acid cleaning column, or purified in some other approved manner.

The containers in which meter mercury is kept must be perfectly clean. Mercury kept in clear glass bottles is easily observed for cleanliness. An 8 ounce clear glass bottle with a screw-on bakelite lid is a convenient size and can be obtained through most any drug store. Mercury containers should be cleaned with a cleaning solution such as 10 percent sulphuric acid with a small amount of potassium dichromate, rinsed thoroughly with clear water and turned upside down to drain and dry without wiping.

Cleanliness, alignment, proper stuffing box adjustment and appropriate grease or packing are necessary in all types of *differential bearing shaft assemblies.* Bent shafts should be replaced immediately. When operating under high pressures, it is sometimes practically impossible to adjust the stuffing box so as to entirely avoid leakage without causing a bind. The use of a heavy grease, such as water pump grease, will sometimes solve the problem in stuffing boxes of the enlarged grease compartment type. A very slight leak at this point may sometimes be less harmful than binds that might result from adjustments to eliminate the leak. The true shape of the bearing surfaces in back-bearing assemblies should never be marred by the use of harsh abrasives, as the bearings are shaped to conform to each other and any change in the original surfaces is apt to cause misalignments.

For testing *static pressure springs,* spring type test gauges are adequate, but should be checked against a dead weight gauge tester every few days to insure dependability. Some companies, however consider the use of dead weight gauges more dependable and economical.

The accuracy of static springs should be determined at the maximum operating range, at zero and at least two uniformly spaced intermediate points. Static springs, if properly calibrated and maintained, will generally retain their accuracy for long periods of time, if not subjected to widely varying temperatures or excessive pressures.

The harmful effects of dirt and binds in static pressure movement assemblies is generally underestimated. Errors caused by such conditions are often blamed on faulty construction or design if they cannot be offset by the adjusting mechanisms. For proper cleaning the assembly should be dismantled, and, with the exception of the spring, every piece should be cleaned and polished brightly with metal polish. Special attention should be given to each bearing point to insure perfectly clean surfaces.

For proper action perfect alignment is essential. Care should be taken to avoid binds between shoulder screws and connecting links. Any screw over-tightened might cause a bind.

The differential and static pen arms should be kept clean and straight and should firmly hold the pen in a position perpendicular to the chart. Pen arms and pens are inexpensive and meter men should carry a supply of them so that defective ones can be replaced without delay. Both pens should arc properly and the time difference between the two should be less than five minutes on a 24-hour chart and less than thirty minutes on a seven day chart. Pen arms having a length adjustment simplify arc and time limit adjustments. The pens should only touch the chart lightly without bearing any surface stress. If an ordinary pen arm will not hold enough ink to complete a revolution of the chart, the use of a fountain pen will usually solve the problem.

Chart Ink should be kept clean and in bottles having properly fitting ink droppers. Extra ink droppers are inexpensive and old damaged ones should be replaced with new ones. Ink bottles should be washed out thoroughly before refilling with fresh ink. Contaminated or improperly handled ink is often the cause of bad chart records.

Care of Clocks

Orifice Meter Clocks will keep correct time if kept in good condition. Probably the best practice is to let the clock remain in service as long as it functions properly, but as soon as it shows any inclination to keep incorrect time or give trouble by stopping, it should be replaced and taken to a jeweler for inspection and cleaning.

A continuous record of the dates of clock changes kept on a small tag or card, posted in the meter case, will reveal exactly what kind of service each clock renders and what the

average length of service is. A 4 x 2-inch blank cardboard tag is a good thing to keep this record on. By using both sides of the tag there is enough space to ordinarily last a number of years, and yet it is small enough to be kept in the meter case without being in the way.

When installing a clock, the mounting screws should not be over tightened, but should be snugged only to a point sufficient to hold the clock in place. Over-tightened mounting screws often result in binds, which invariably decrease the efficiency and the life of the clock.

Under ordinary operating conditions *orifice meter charts* are generally true, but at each meter test a sample chart from the current supply should be checked for out of round or off center conditions.

Piping Assembly

The static and differential *gauge piping assembly*, generally referred to as the "Manifold," often is of such construction that it transfers harmful strain to the orifice gauge, causing inconsistencies in meter action. The Manifold should be so perfectly fitted that it will not cause even the slightest strain on the gauge. One point at which strain often occurs is at the static connection. Strain at this point is successfully avoided by the proper installation of flexible copper tubing.

As manifold leaks can cause direct errors in static and differential readings and often result in freezing trouble, not even the slightest leak should be tolerated. A shut-in test, lasting at least one minute, should always be included in the meter inspection routine. If the shut-in test indicates leakage, the manifold should be completely soaped, the leaks located and repaired.

The needle valves on the manifold should be observed closely to keep the valves and stuffing boxes in good condition. If gas leaks through a needle valve when it is closed to normal tightness, extreme pressure should not be applied to the hand wheel to effect a shut-off. The valves should be inspected and cleaned and if necessary should be reground. Stuffing box packing should be changed often enough to avoid the necessity of tightening packing nuts excessively.

If the actual condition of pressure *tap holes* is not definitely known, they must be inspected before the meter inspection can be considered complete. If the inspection reveals non-conformity to standard practices, such as holes too small, the presence of burrs, fittings extending inside the pipe wall, or distortion caused by welding a fitting to the pipe, changes should be effected to correct such conditions.

Meter Plate Care

When inspecting an *orifice meter plate,* the cleanliness, the sharpness of the upstream edge, thickness of the orifice edge, beveling, flatness and orifice diameter should be carefully noted. Plates that do not conform to accepted standards should be rejected. No attempt should be made in the field to sharpen the upstream edge of the orifice. This can only be properly done in a lathe by refacing the plate. It is suggested that rejected plates be accumulated at a centralized point on the system for special handling.

Plates should not be allowed to rust while in storage and should be stored or transported between non-metal surfaces, to prevent the edges from coming in contact with metal objects. Metal polish is good for cleaning tarnished plates, but should not be used on the orifice edges. Flange gaskets should be inspected to make sure they do not extend inside the cored opening of the flange. Most orifice meter flanges are made so the bolts will hold the plate exactly centered, but this point should be checked and not taken for granted. The orifice diameter should be checked against the plate number to make sure the size indicated by the number is correct. The orifice to pipe diameter ratio should be checked for compliance with recommended limits.

The recommended orifice to pipe diameter ratio is dependent on whether or not there is a recess greater than ¼-inch preceding the orifice plate either in the *orifice flange* or between the end of the pipe and the plate. The *flanges* should be parted so the inside can be inspected. If there is a recess greater than ¼-inch, a $\frac{d}{D}$ ratio tag should be posted in a conspicuous place on the flange, so in the future plate changes, the recommended limits will not be exceeded.

The length of *straight pipe run preceding the orifice* should be determined. The presence of regulators, throttling valves, reducers, fittings, changes in direction and other conditions in the inlet run, which might cause flow disturbances, not having been offset by the use of straightening vanes, should be considered in judging the adequacy of the observed length. By referring to Gas Measurement Committee Report No. 2, the permissible $\frac{d}{D}$ ratio for various conditions may be determined.

Miking of orifice meter runs is generally done with inside micrometers, or an inside caliper and a vernier slide caliper combination. A reasonably accurate knowledge of the average inside diameter and degree of out of roundness can be obtained by taking four equally spaced inside diameter measurements at each of the following points: 1 inch from the face of the flange, ½ of 1 pipe diameter from the face of the flange, and 1 pipe diameter from the face of the flange. When the pipe has been welded to the flange, four equally spaced inside diameter measurements should be taken at the point of the weld to ascertain to what extent the inside surface of the pipe has been distorted by the welding. Generally, if electric welding is used, and a series of very light welds are applied, with time allowed for each application to cool before the succeeding one is applied, the heat is not concentrated enough to cause excessive distortion of the inside surface of the pipe.

Meter runs equipped with a pair of flanges near the opposite ends of the setting are easily taken apart for inspection. The accompanying drawing of a multiple run orifice meter setting shows the arrangement of flanges to facilitate inspecting meter runs and straightening vanes.

Straightening vanes act as an obstruction where welding beads, grease from lubricated plug valves, line dust and other foreign particles accumulate. They should be inspected and cleaned periodically.

The accuracy and proper maintenance of appurtenant instruments, such as thermometers, pressure gauges, specific gravity balances, dead weight testers and test gauges, water columns, and all other instruments used in conjunction with orifice measurement is of prime importance. Each should demand the specific attention it requires in order to insure accuracy in even those orifice meter settings that may be considered faultless.

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Presented at the East Texas Chapter of the American Petroleum Institute, Kilgore, Texas, October 5, 1937.

Plug Back Work

IN THE

East Texas Field

By R. H. MAPLES
Cities Service Oil Company;
F. J. MIKESKA,
Gulf Oil Corporation

THE recent rapid encroachment of Woodbine water in the west side of East Texas field has impressed operators that it will be one of their most serious problems in lease operations, and, for this reason, it has confronted them with the necessity of adopting methods of controlling water production or providing adequate means of disposal.

It is generally recognized among operators that steps should be taken to keep water production down to a minimum, not only to prevent the cost of lifting and subsequent handling of the water, but also for the maintenance of reservoir pressure to insure longer flowing life for the field.

Two Methods

The Woodbine sand of East Texas field has a high permeability and an average porosity of approximately 25 percent. The field is under a water drive from the west, and water is directly under the oil in a large portion of the field. However, due to shale breaks, the level of the water may not be constant even from one location to the next. Woodbine water easily may be identified by its chloride content, and it is usually determined by this characteristic before an operator does plug back a well.

At present the principal methods used in shutting off bottom-hole water are by placing a cement slurry in the bottom of the well bore to form a plug, or by forcing this cement slurry from the well bore into the sand section to form a false cap. These methods are generally known as "non-squeeze" and "squeeze." To obtain reasonable success in plugging back wells to shut off bottom hole water by these methods, the actual conditions of the sand exposed should be known in order to determine the best method of plugging and the procedure to follow. These bottom hole conditions can usually be obtained from driller's well logs, or, if not available there, can be obtained by electrical logging.

Non-Squeeze Procedure

The well should be killed, cleaned out to bottom, and the total depth checked with a steel line. The sand face should then be cleaned thoroughly by pumping water into the well through tubing spaced one foot off bottom. A sufficient amount of approximately 15-pound cement slurry required to plug back to the desired depth should then be placed into the well bore. The cement slurry may be placed either by dump bailer or by pumping it into the tubing spaced one foot off bottom and displacing with water. The amount of water necessary to make this displacement should be calculated and measured into the tubing. After the cement is placed, the bottom of the tubing should be raised to desired top of cement plug and circulation reversed to wash out excess cement. The tubing should then be raised and cement allowed to set for 24 hours minimum.

Squeeze Method Procedure

In the squeeze method the well should be prepared in the same manner as described in the non-squeeze method. With the casing and tubing loaded with water, pressure is applied by pumping water into the tubing until the water is started into the formation. This is done to break down the resistance at the sand face to prepare it to take the cement slurry. The water is then followed with 12-pound cement slurry, which may be increased to 15-pound if the 12-pound slurry is being squeezed into the sand section without requiring excessive pressure. Each well presenting a different problem, the amount of cement squeezed into the sand section must be determined during the actual performance of the "squeeze." In most cases 200 sacks of cement will be the maximum required. After the required amount of cement is squeezed into the sand, circulation is reversed to wash excess cement from the tubing, and in some cases the cement slurry in the hole is al-

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TABLE NO. I

Success of Different Plugging Methods for Varying Sand Penetrations

Sand Penetration, Feet	SQUEEZE METHOD				NON-SQUEEZE METHOD			
	No. of Wells Plugged	Successful Plugbacks		Percent Successful	No. of Wells Plugged	Successful Plugbacks		Percent Successful
		Yes	No			Yes	No	
1	1	..	1	...	..	..	..	...
2	3	..	3	...	..	..	..	...
3	3	3	..	100	..	..	..	...
4	5	2	3	40	1	..	1	...
5	1	1	..	100	1	1	..	100
6	4	2	2	50	..	..	..	...
7	4	4	..	100	1	1	..	100
8	3	3	..	100	2	2	..	100
9	3	2	1	67	2	1	1	50
10	4	3	1	75	..	..	..	...
11	1	1	..	100	1	..	..	100
12	7	4	3	57	5	2	3	40
13	1	1	..	100	2	2	..	100
14	2	1	1	50	4	4	..	100
15	3	2	1	66	2	2	1	50
16	..	..	..	...	..	..	..	...
17	1	1	..	100	..	..	..	...
18	1	1	..	100	..	..	..	...
19	1	1	..	100	2	2	..	100
20	..	..	..	...	..	..	..	...
21	2	2	..	100	1	..	1	...
22	..	..	..	...	..	..	..	...
23	2	2	..	100	1	1	..	100
24	..	..	..	...	2	2	..	100
25	1	1	..	100	1	1	..	100
26	..	..	..	...	..	..	..	...
27	..	..	..	...	1	..	1	...
28	1	1	..	100	..	..	..	...
29	..	..	..	...	1	1	..	100
30	1	1	..	100	3	3	..	100
Total	55	39	16	70.8	33	25	8	75.7

lowed to set for 24 hours under pressure. During recent squeeze jobs, some operators have used cement retainers because in some cases high pressures must be used to perform the squeeze. When a cement retainer is used it is usually set near the bottom of the casing.

The pump pressure necessary to start water into the formation, commonly called the break-down pressure, varies in different parts of the field. North of the Sabine River the average break-down pressure is 850 pounds, in the Kilgore area the average 750 pounds, while in the south portion of the field the average is 550 pounds. To date the highest break-down pressure required in the field has been 1000 pounds.

In an effort to compare the merits of the two methods of plugging off water, data have been prepared showing the percent of successful water shut-offs that operators have experienced in wells of varying sand penetration as shown in Table 1. Data as to water level in the wells were not available, and some failures in wells with considerable sand penetration are probably due to water being very near the top of the sand.

Summary

In preparing Table 1 all of the available plug-back data in the East Texas field were assembled and classified under the two different methods of placing the cement and grouped according to sand penetration prior to plugging back. These data included the plug-back work of all operators in the field that had this type of information available. Therefore, it should be representative information for the field, and not simply the method of operation of a few companies. In classifying these plugback jobs as to successful and unsuccessful, in all cases where the water percentage was reduced 50 percent or more, the plugback was considered successful, and unsuccessful where the water was not reduced as much as 50 percent.

In summarizing Table 1 there are 55 squeeze jobs, of which 39, or 70.8 percent, were considered successful, while by the non-squeeze method 33 plug backs were attempted, with 25, or 75.7 percent, considered successful. From this analysis it is evident that the non-squeeze method has shown a greater percent of successful water shut-offs. However, while these data were being assembled and classified, it was noted that the water shut-offs of wells of 10-foot penetration or less were more complete in cases where the squeeze method was used. From further analysis of this table it is seen that 31 squeeze jobs were attempted on wells having from one to 10 feet of sand penetration, while only seven non-squeeze jobs were attempted in wells having 10 feet or less of sand penetration, and none in wells of less than four-foot penetration, which indicates that operators prefer the squeeze method in wells of small sand penetration.

Using information available from six of the major operators in the East Texas field on plug-back operations during the past 12 months, Table 2 was prepared to show the general preference of this group as to the method of placing cement in the well for plug-backs. From this table it can be seen that during the six months from September 1, 1936, to March 1, 1937, five squeeze jobs and four non-squeeze jobs were performed, and during the next six months from March 1, 1937, to September 1, 1937, 24 squeeze jobs and seven non-squeeze jobs were performed. This being a 380 percent increase in the squeeze method of plugging back and a 75 percent increase in the non-squeeze method.

Due to the success of shutting off bottom hole water by plug-back work in the East Texas field every operator should take advantage of these methods and attempt to keep water production down to a minimum. By doing so the operator would benefit by reduced lease operating expense, due to the reduction of cost of lifting and subsequent disposal of bottom hole water and by the maintenance of reservoir pressure which would insure longer flowing life for the field.

TABLE NO. II

Comparison of Methods of Placing Cement Plugs

	March 1, 1937 to Sept. 1, 1937	Sept. 1, 1935 to March 1, 1937	Percent Increase
Squeeze Jobs	24	5	380
Non Squeeze Jobs	7	4	75
Total Plug Back Jobs	31	9	244
Squeeze Jobs	77 percent	55 percent	
Non squeeze Jobs	23 percent	45 percent	

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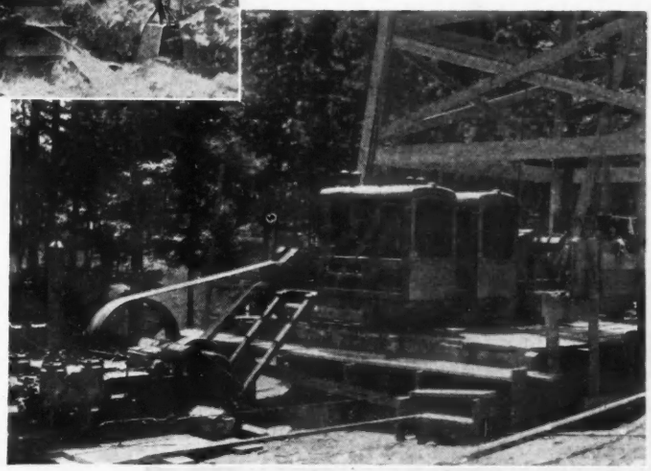

Left: Two International PA-100 Power Units used by T. L. Benson, drilling contractor, to power a portable rig. They are shown here drilling in the Grogan field, De Sota Parish, Louisiana

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This paper originally was prepared as a report to the Committee for Study of Practical Methods, and was first presented at the Southwestern Gas Measurement Short Course School at the University of Oklahoma at Norman, April 20 to 22, and later was presented at the American Gas Association meeting in Cleveland, Ohio, Sept. 27 through Oct. 1.

Problems Of Regulator Freezing

By M. A. HARDIE, JR.,
Montana Power Company, Butte, Montana

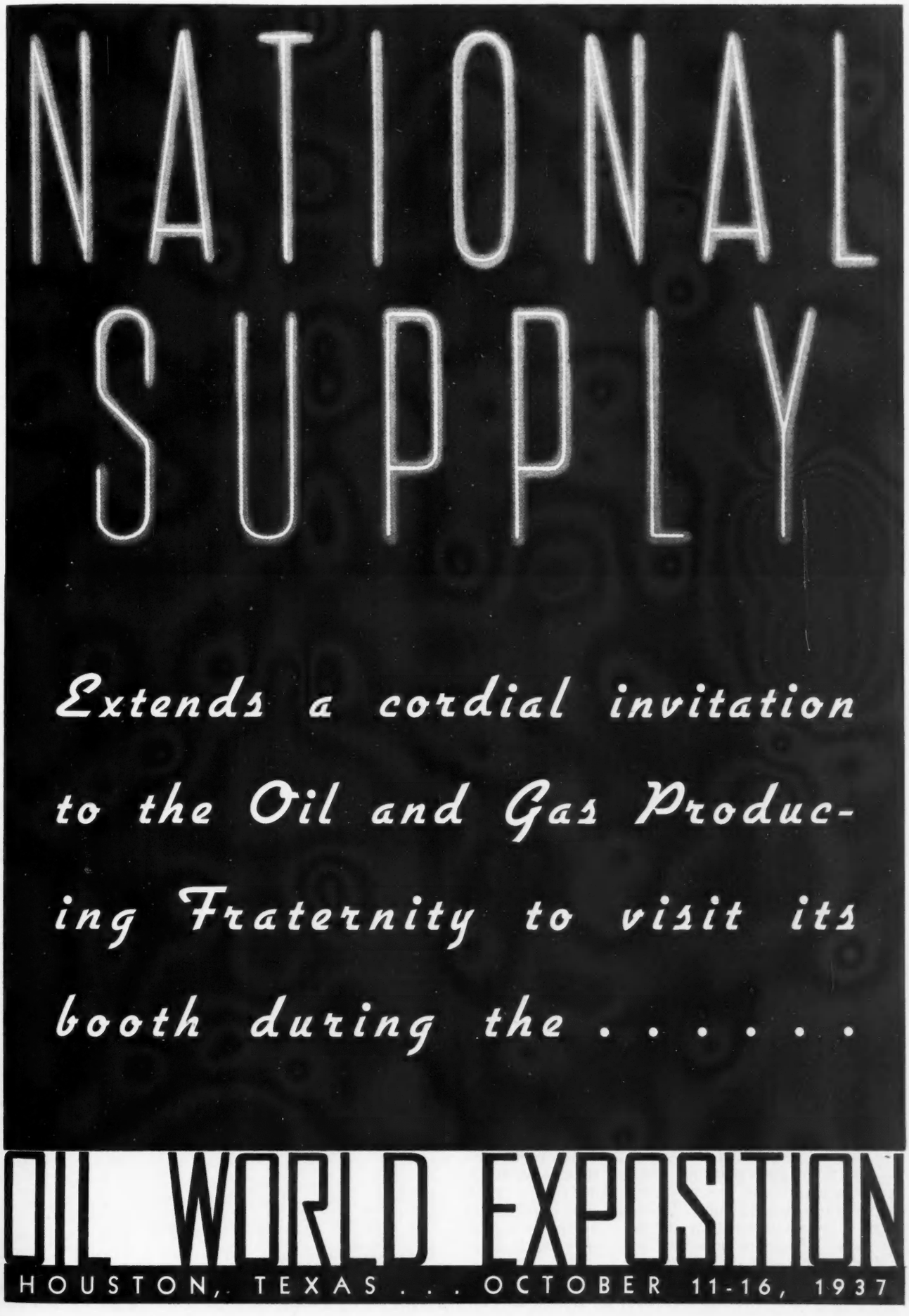
THE failure of equipment designed to reduce gas pressures to function properly, when that cause is positively known to be what is generally termed "freezing," is not confined to operator, to company, to locality, or to equipment type. Freezing occurs in pressure control devices more often in some localities than others and more frequently in some installations of a given locality than others; it is the intent to attempt to supply information as to why this occurs and when these difficulties may be expected. It is superficially peculiar that with the advent of greater knowledge regarding freezing in natural gas lines that freezes are apparently more frequent; basically, it is probable that what was heretofore considered a fault of the device is now definitely known to be the result of ice-like formations due to operating conditions.

Causes of Freezing

It is desirable to be accurate in phraseology, and hence it might be well to state initially the proper description of regulator failure from freezing. It is unusual that the temperature of gas is measured as 32° F. or less. It is common experience, probably to the majority of those men in the mid-continent assigned to the responsibility of operation of pressure reduction equipment, that freezing has occurred when the gas temperatures were appreciably above 32° F. Since water forms ice at 32°—and the variation of the freezing point by virtue of application of pressure is so slight as to be not pertinent to the discussion—then it is self-evident that the concern is not with ice of the common sort. It is true that the amorphous, translucent, white solid that is found in frozen regulators looks like ice, and upon melting produces water, and that the temperature of the mass melting under atmospheric pressure will be 32°; however, a slight ebullition may be noted in melting, and, moreover, the gas so given off is inflammable. This material has been entitled "hydrates of natural gas," by virtue of the fact that one molecule of a hydrocarbon in the gas unites with six or seven molecules of water to form what will be hexa or hepta hydrates respectively. These materials were originally known as early as 1904 from investigations by the Frenchman, DeForcrand. Hammerschmidt reported in Industrial and Engineering Chemistry in August, 1934, data which definitely associated the formation of hydrates in gas with what had heretofore been known as "pipe line ice."

The conditions under which hydrates will form are: First, there must be liquid water present; second, a nucleus must be present around which the material can grow; third, the pressure must be sufficiently high or the temperature sufficiently low to permit growth. High velocities and turbulence will aggravate the accumulation. Experience has fostered the belief that all natural gases as produced are saturated with water vapor to the temperature and pressure of production. Later in the paper, methods will be delineated by which this water vapor may be transposed into its liquid state. The necessary nuclei, which may be a particle of scale or dirt, would naturally abound in any regulator body. The later discussion of regulator types will have reference to high velocities, friction, and turbulence.

Figure 1 is a curve showing the melting points of hydrates from Cut Bank gas at various pressures. This curve was established by the device shown in Figure 2. The procedure was to condense water on the metallic tube as seen through the sight glass, form the hydrate, and then note the temperature and pressure at which melting started to occur. It might be noted that the curve shown does not vary greatly from, and is parallel to, the curve of Hammerschmidt which gives rise to the suggestion that the curve is general for normal natural gases; likewise, it is possible that other hydrate curves will be parallel. It is not known of any experimenting having been done below 32° F., but it is interesting to contemplate that, should the extrapolation of the curve below the water freezing point hold true, then the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HOUSTON, TEXAS . . . OCTOBER 11-16, 1937

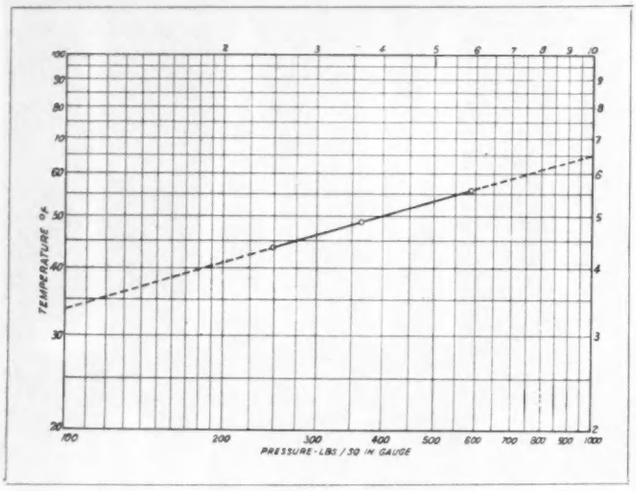


FIGURE 1
Melting points at various pressures of hydrates formed from Cut Bank gas.

hydrate point of gas at 50 pounds would be 27½° F.

The record of freezing in a regulator is excellently portrayed in Figure 3. Notice the sharp breaks in the static pressure which are even more definitely portrayed in the differential. There is no tendency to assume a higher or lower pressure, but record indicates a range above and below the control point. The cause of such a record is the fact that hydrates forming have increased the friction between the valve and guides. Note also that in cases where there has been any constancy of load for a few minutes it is immediately followed by a sharp change in pressure. This is caused by a bond forming between the valves and seats or guides which requires the accumulation of a considerable amount of pressure to break the bond. Observe that at 3:45 p.m. the static fails to show any further effects of freezing. Notice the accompanying chart recording temperatures of gas at regulator exit which shows that at that time the gas had increased in temperature slightly over 2°. The heat was applied by means of a heated liquid circulated through a jacket on the incoming line.

Cases have been known wherein sufficient ice has been formed by the refrigeration of expanding gas leaking through the stuffing box that the block of ice so formed on the stem would prevent proper travel of the valve. It is, of course, possible for hydrates to form within the valve box to such an extent that no gas would be permitted to pass or the valves would not be permitted to close to shut off the flow. Reference will be made later to freezing in different types of regulators and their resistance to freezing.

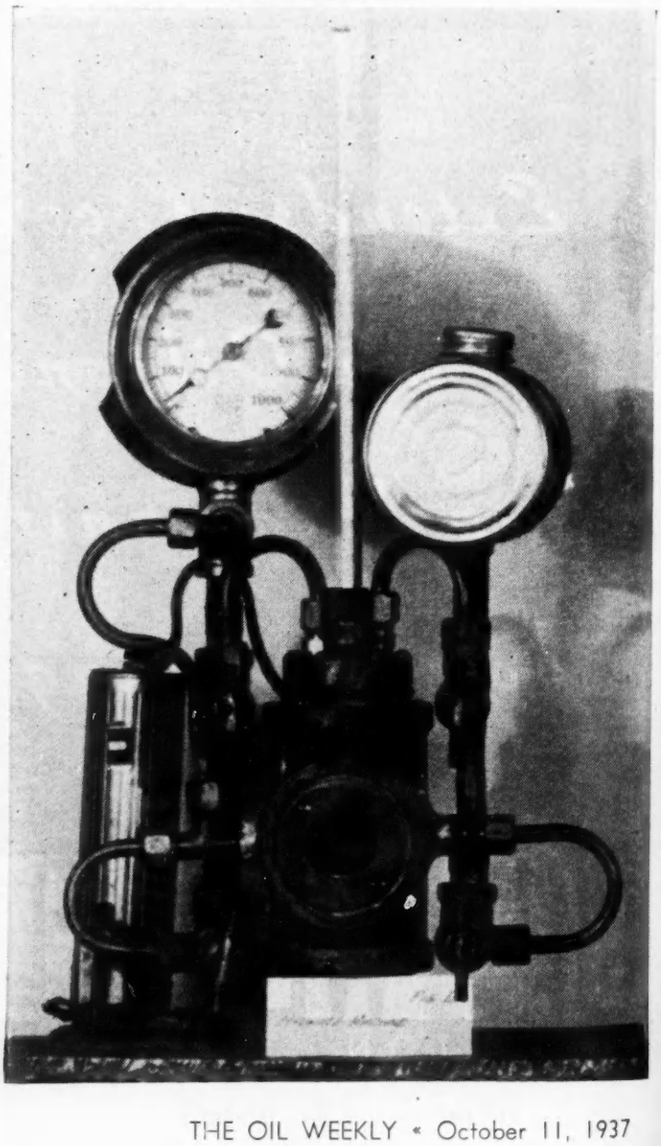
Prevention of Hydrates

The prevention of hydrate formation in regulators may be accomplished by either of two major or a third minor course. It is self-evident that if no liquid water were present or if such water as was present was suitably inhibited that no hydrates would form. Secondly, it goes without saying that should the temperature of the gas be above the hydrate point, no hydrates would form. Thirdly, if the regulator were so constructed that the temperatures reached by virtue of expansion were sufficiently small as to maintain the gas temperature above the hydrate point, no difficulties would ensue.

It is necessary, if the moisture is to be removed, to know the amount of moisture present. A great many times it is possible to calculate the amount of water vapor in the gas under a given set of conditions by following two assumptions which experience has proved to be sufficiently correct for all practical purposes; namely, that natural gas leaving the well head is saturated at the temperature and pressure there existing; likewise, gas leaving a gasoline plant can be assumed to be saturated with water vapor at the temperature and pressure existing in the top of the absorber. Calculations here involved are merely comparisons of the cubic foot under the temperature and pressure at the regulator inlet with the temperature and pressure of the gas when it was known to be saturated.

Figure 4 is a nomographic chart for the solution of this problem. This chart is constructed to indicate the pounds of water in the vapor state in a million cubic feet of gas under standard conditions with conversion of that standard volume to the temperature and pressure of saturation; no allowance is made for deviation from Boyle's Law. The method of construction of the chart is straightforward with the exception of the left-hand scale which, though it is designated as a scale of temperatures, is plotted as a logarithmic scale of the weights of a cubic foot

FIGURE 2
Hydrate Machine.



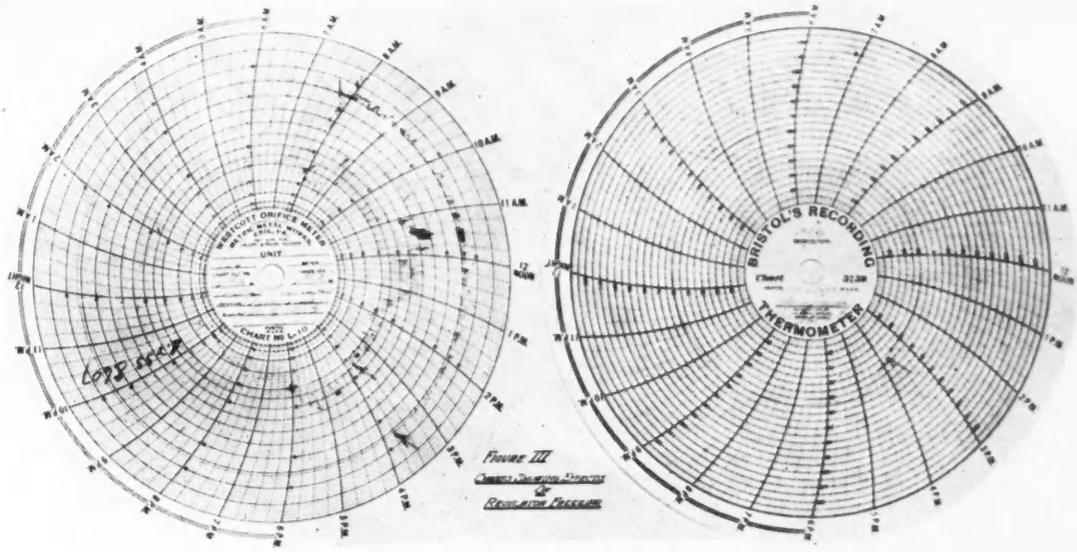


FIGURE 3
Charts showing effects of regulator freezing.

of water vapor at the designated temperature. The method of operation is to project a line by means of an isopleth from the temperature of the gas on the left-hand scale through the absolute pressure on the central scale to an intersection on the right-hand scale which will be the weight of water vapor existing in a million standard cubic feet. For any other conditions, rotate about any point or project another line based upon such conditions.

Water Vapor Calculations

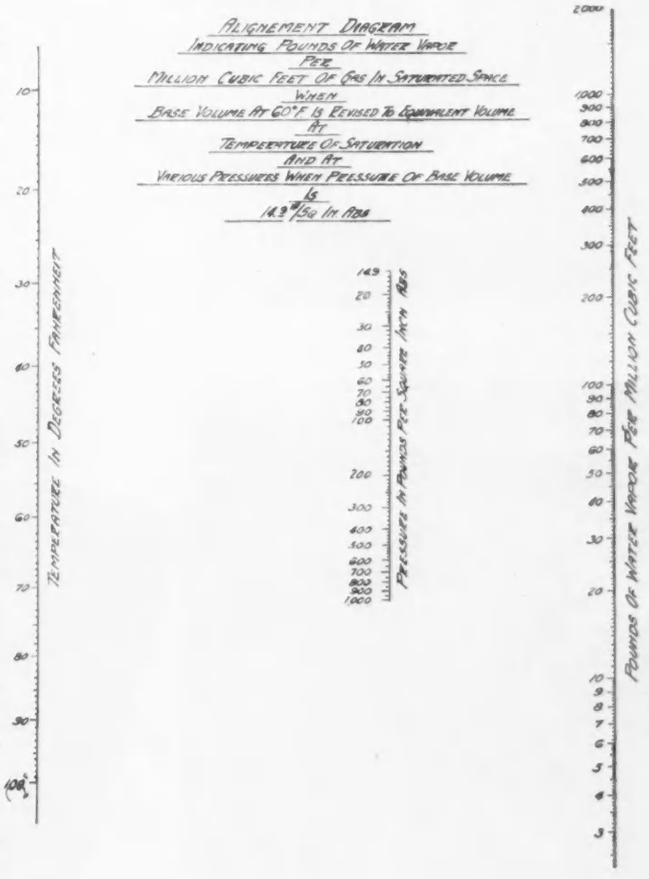
Conditions are frequently encountered under which it is desirable to ascertain the actual water content of the gas. Because the dew point of the gas is so closely associated to the problem of freezing and because a knowledge of dew points is so invaluable to pipe line and regulator operation, in that it will permit a knowledge of when difficulties may be expected, it may not be amiss to mention some of the means of dew point measurements.

Water vapor calculations seem to cause sufficient difficulty in some instances as to merit here a brief review of fundamentals and methods of typical computations. It is pertinent to insert the data here, since it is a clue in interpretation of results from various methods of determination of moisture contents.

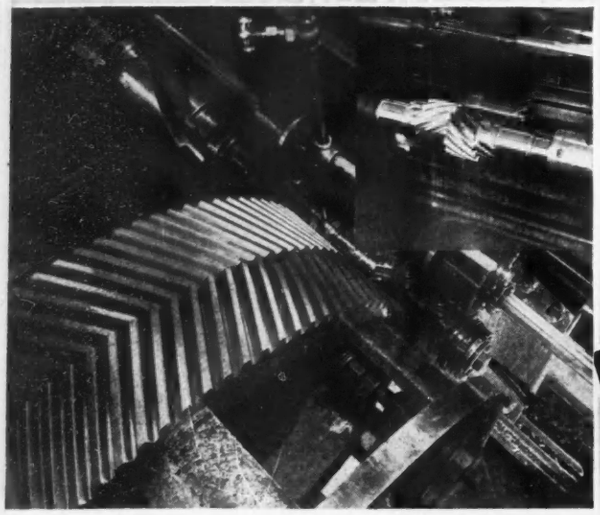
Pressure. The bombardment of gas molecules against the walls of the container enclosing it is measured as pressure. The frequency of bombardment is an index of the pressure intensity. Dalton's Law of partial pressures states in effect if two or more gases are mixed with no chemical reaction, then the molecules of each bombard the walls, creating pressure, as though it were the only gas present.

Vapor Pressure. Should a liquid partially fill a container, then molecules of the liquid will leave the surface and enter the space above to bombard the walls and create pressure. Naturally, some of them will go back into the liquid; when the same number of molecules are leaving the liquid as are entering it, equilibrium is said to prevail, and the molecular bombardment in the space is spoken of as the vapor pressure of the liquid. Other things being equal, the vapor pressure of a liquid is solely dependent upon the temperature. When the partial pressure of a gas component in a space is less than the vapor pressure of that gas at the temperature of the space, the partial pressure expressed in terms of the vapor pressure is percent relative humidity. When the quantity of vapor in a space is definitely stated in weight units, the absolute humidity is then given.

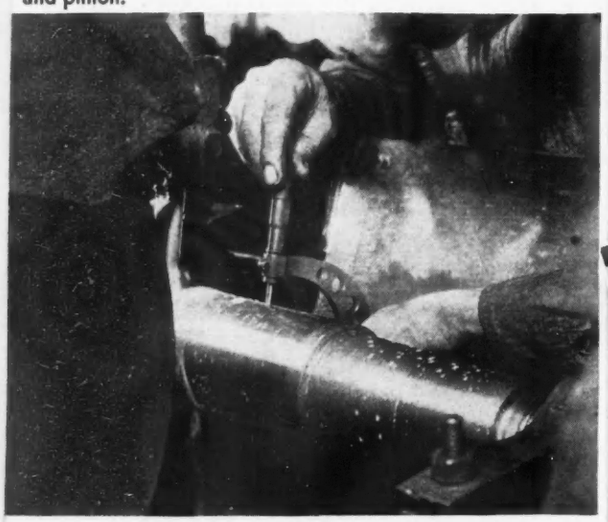
Dew Point. When the partial pressure is equal to the vapor pressure of a gas at a given temperature, then that temperature is the dew point or the saturation point. Any compression of that space then would


Alignement Diagram
Indicating Pounds Of Water Vapor
Per
Million Cubic Feet Of Gas In Saturated Space
When
Base Volume At 60°F Is Revised To Equivalent Volume
At
Temperature Of Saturation
And At
Various Pressures When Pressure Of Base Volume
Is
14.9 #/Sq In Abs
Temperature In Degrees Fahrenheit
Pressure In Pounds Per Square Inch Abs
Pounds Of Water Vapor Per Million Cubic Feet

The Heart of a "A Good Heart is W



All herringbone gears are generated on Sykes Patented gear generators in our own plant and under the most rigid inspection system. Photos show cutters in action generating gear and pinion.

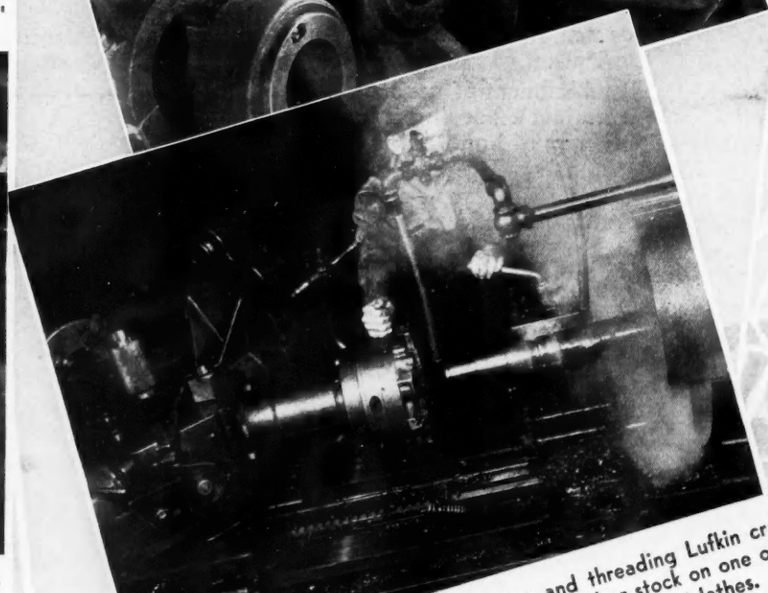


Grinding for accuracy. All shafts, pinions, crank pins, etc., are ground to absolute micrometer size.

The most modern type of turret lathe — one of a battery performing similar operations. Note that boring, facing and turning rough and finish cuts are completed in one operation.

What is said to be the most expensive and the most accurate bar yet built for precision boring of parallel bearings. This photo shows cover removed revealing its particular operation.

This shows start of boring operation. Every Lufkin Unit is bored to absolute accuracy with similar jigs and with similar bars.



Turning and threading Lufkin crank pins from heat-treated bar stock on one of the most modern types of turret lathes.

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Is Worth Gold"

Shakespeare

Shakespeare had the right idea!

Of course, he had reference to the human heart. But, after all, the heart of any piece of machinery is just as important, relatively, to the worth of a particular machine as the human heart is to the soul of man.

- **Only materials of the finest character — the very best now obtainable—go into the making of Lufkin Units.**
- **The finest and most modern tools — marvels of mechanical science — produce parts to precision for Lufkin Units.**
- **Skilled workmen — specialists with years of mature experience — men with their hearts in their jobs — assemble and construct Lufkin Units.**
- **There is little wonder that Lufkin, pioneers in the production of geared units for oil well pumping, has maintained its leadership in this field.**
- **Lufkin has always produced Units with "Hearts worth Gold."**

Testing pinion shaft blank for eccentricity before generating herringbone teeth. Accuracy, here, is of extreme importance.

Testing gear teeth for hardness.

Accuracy of tooth formation meets most rigid inspection.

Herringbone gear cutters must meet final inspection after grinding before being sent to gear generators.

INSPECTION SHEET

Final inspection blank that has passed from operation to operation for the final "O. K." by the inspection department and after gears have been "run-in." The unit is now ready for shipment to customer.

cause condensation. Any expansion of that space would allow further vaporization; however, if no liquid were present to vaporize, then the distribution of the same pressure through the increased volume would cause a lessening of the partial pressure. When water contents are given as weights of water per cubic foot of gas, then reference to either a table of weights of water vapor at various temperatures or partial pressure of water at various temperatures will permit designation of the dew point. The weight or the partial pressure of water vapor under one static pressure condition will bear the same relationship to the weight or pressure of water under any other static pressure condition that the first static pressure bears to the second static pressure.

The intent of the foregoing is to elucidate the facts that vapor pressure is a function of temperature; partial pressure, in the absence of the liquid phase (and the designation as partial pressure infers no liquid, otherwise it would be vapor pressure) can be decreased when the chamber is expanded, or has the static pressure lowered; likewise, the partial pressure would be increased upon contraction of the chamber, or has the pressure raised; in this latter event when the partial pressure has increased to equal the vapor pressure, it has reached its maximum, and further compression produces condensation. The Smithsonian Meteorological Tables available from the Smithsonian Institute, Washington, D. C., contain excellent tables of weights and pressures of aqueous vapors for a wide range of temperatures.

Moisture Content Determination

Some methods of moisture content determination are:

1. *By Adsorption.* This is the most commonly encountered method for measurement of the water content of gases, and, particularly under high pressures, is probably the least satisfactory. It normally consists of running a stream of gas under pressures approximating atmospheric through a series of at least two "U", or other, drying tubes containing phosphorus pentoxide, calcium chloride, magnesium percholrate, sulphuric acid, or some other drying agent. The tubes are weighed before being connected to the gas stream and after a very accurately measured quantity of gas has passed through them. The objections to this method are: A set of analytical balances are required, and an individual possessing the technique to operate them, in order that the weight increase due to absorbed water may be determined with the proper accuracy. It is difficult to accurately measure the quantity of gas involved without use of the wet test meter which would have to be installed after absorption and would of necessity be preceded by a re-saturator. It is necessary to observe and make allowances for the temperature of absorption in accordance with the equilibrium vapor pressure of the desiccant used. The experiment cannot be performed at high pressure; therefore, the magnitude of pressure reduction may create sufficient decline of temperature to condense out some water unless the sampled gas is pre-heated in its initial state. Phosphorus pentoxide has as low an equilibrium vapor pressure as any of the materials listed and is normally quite readily available. Further information of this method is available in practically any high school chemistry text or on Page 129 of publication, "Methods of the Chemists of the U. S. Steel Corporation for Sampling and Analysis of Gases," published by Carnegie Steel Company, Pittsburgh, Pa.

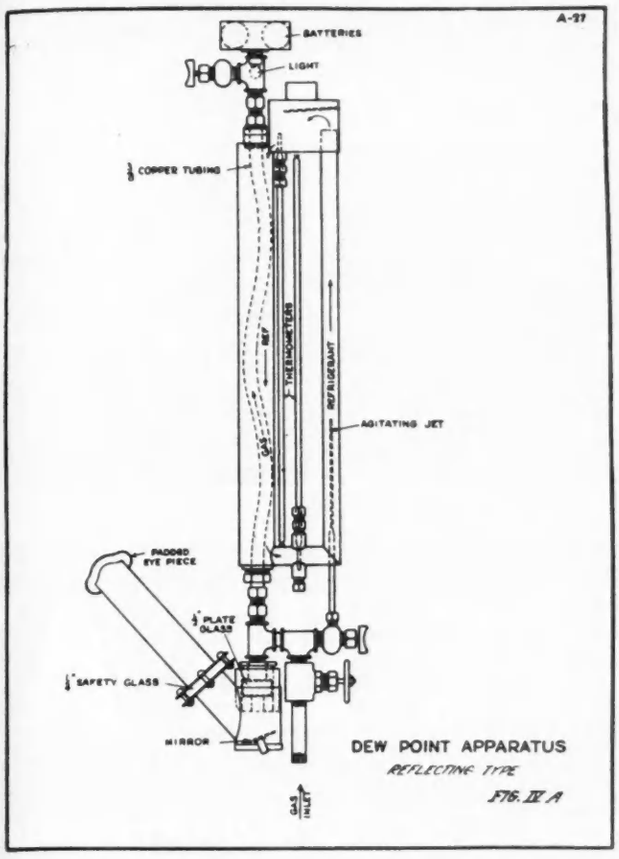
2. *By Adsorption.* The most commonly used materials for this are silica gel, charcoal, or activated alumina. The method of use and the objections are similar to those under "Absorption."

3. *Thermal Conductivity.* This method is founded upon the fact that a wire heated by an electric current loses heat in proportion to the thermal conductivity of the gas surrounding it. Hence, the temperature changes of the wire which is a function of the adjacent gas is measured by a determination of the electrical resistance. The differential of resistances between a wire in a wet and a dried sample is compared with a calibrated scale previously determined from experiments on samples of known concentration. Data on this method is given on Page 194 of "Technical Gas Analysis" by Lunge and Ambler, published by D. VanNostrand Company. The objections to this method are: The equipment involved is expensive; the instrument must be calibrated, and its calibration must be checked frequently; the dielectric of the chambers containing the samples must be maintained in the condition of calibration to avert introduction of errors; but it does have the advantages of being absolutely safe, will handle a flowing sample, and is reasonably portable.

4. *Hygrometer.* This method is dependent upon the physical ability of membranes, or, more commonly, human hairs, to react from the concentration of water vapor existing in the space surrounding them. It is to be deplored that this method is limited in use in that its accurate range is, roughly, from 10 percent to 90 percent relative humidity; if work is done under high pressure, then the critical range is from 90 percent to 100 percent humidity; or if expansion takes place down to a lower pressure, then it is usually from zero to 10 percent relative humidity, in which most interest is evinced. Another drawback to the scheme is the delicacy of the actuating medium and insufficient power to transmit the small amount of movement from the interior of a high pressure chamber to a scale on the exterior. It, too, requires initial calibration and frequent references to a standard in order that its accuracy may be maintained.

5. *The Psychrometer* or so-called Wet and Dry Bulb. This is probably the method most generally followed in the gas industry. It is completely discussed on Page 122, et seq., of the U. S. Steel Handbook. Inasmuch as the depression of the wet bulb is indirectly a straight line function of the absolute pressure, it follows that under high pressures and normal temperatures, a negligible depression of the wet bulb is the difference between a saturated or nearly dry gas. While it has the advantage of working from a flowing sample, the adherence to the requirements of a 10 foot per second velocity of the sample past the thermometer bulbs means a considerable volume of gas.

6. *Condensation Method.* The foregoing methods are all based on measurement of water content. The following methods are for the direct observation of the dew point. Figure 4-A is the Martin method wherein the gas is passed through a bent copper tube whose interior has been polished. A refrigerant chamber surrounds this tube. A light is placed at one end of the tube; the tube is so bent that the light cannot be seen through the glass partition at



the other end but rather a glow is noted due to the reflection of the light from the walls. When the temperature of the refrigerant medium has reached the point that liquid is condensed from the gas stream on the interior walls of the copper tube, the light is no longer reflected and apparently goes out. The observed readings of the thermometers placed in the refrigerant stream are the dew point of the gas at the pressure of test. This method has the objection that gasoline as well as water will condense on the walls and destroy reflection.

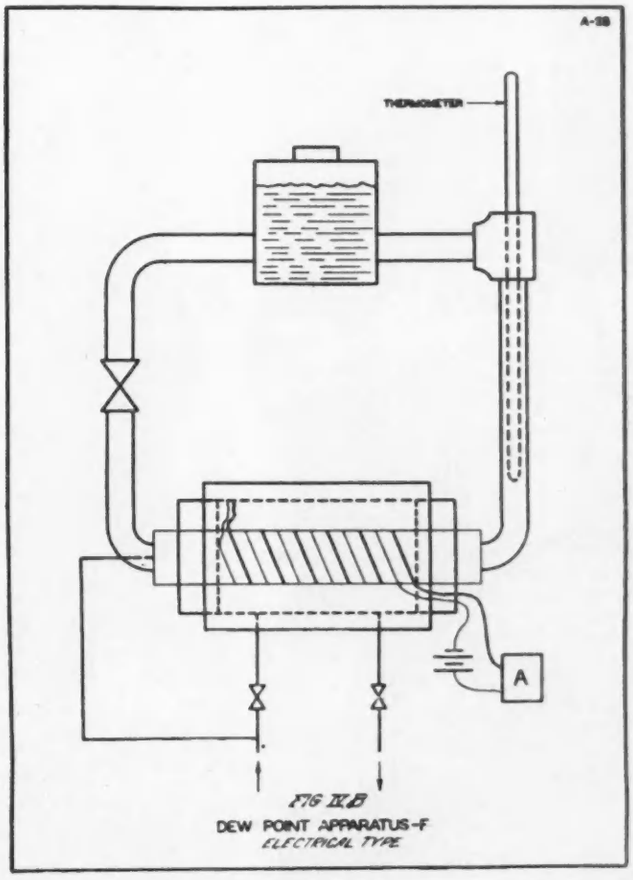
Figure 4-B is an electrical apparatus also designed by A. B. Martin of The Montana Power Company, consisting of a 1/32 inch wall tube 7 inches long wrapped with a pair of wires consisting of one No. 20 S. C. C. and one No. 28 bare approximately 30 feet long, cemented in place with Duco cement. The wires are then sandpapered off so that bare wires are exposed but not shorted. The tube is installed in a 2-inch collar, the ends being brought out through pressure tight connections and connected to a refrigerant reservoir above the collar. Connections are made to the collar as indicated so that the gas to be tested may be passed through the collar and over the tube, a small by-pass being provided leading to an agitating jet inside the tube. One end of one of the wires is grounded and the other ends are brought out through the connection to the collar and connected in series with a 2 volt flashlight battery and a 0 to 200 micrometer. A thermometer is placed in the refrigerant as shown. With the gas to be tested flowing through the collar, the temperature of the refrigerant is reduced gradually by cracking the valve on the by-pass to the agitating jet and at the point where dew is deposited from the gas as indicated by a sudden increase in the current flow as shown by the micrometer, the thermometer is read and the observed temperature is taken as the dew point. This scheme has the objection of requiring a certain amount of technique to operate, but it has the very important advantages of being unaffected by gasoline or oil, is extremely accurate, readily portable, and, barring the venting of gas used for agitation, is entirely safe. The direct current source has the objection that momentary readings must be taken to obviate polarization; naturally, a low voltage A. C. source would eliminate this criticism.

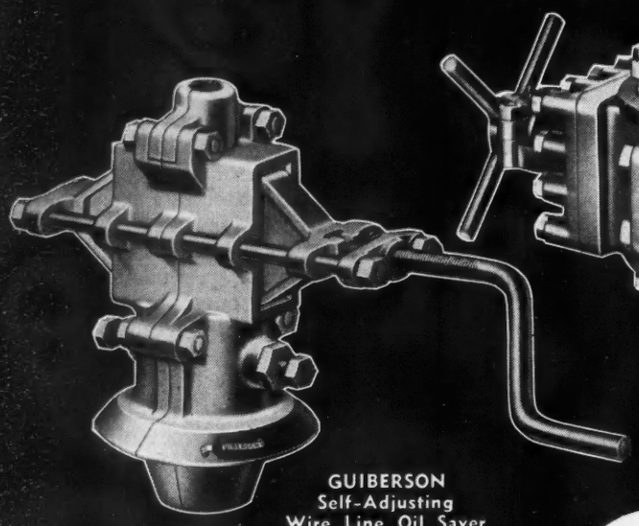
The apparatus shown for determination of hydrates in Figure 2 can be used for the direct observation of the dewpoint. A certain amount of skill is required, however, to prevent the reading of false low dew points; there is also involved the hazard of the sight glass under pressure, and considerable experience is necessary in order to determine whether a gasoline or a water dew point is being obtained. The presence of the water dew point can be accentuated by banding the surface of the tube with some comparatively insoluble salt, such as barium sulphate.

Dehydration Systems

It is barely conceivable that a system of dehydration should be installed for the sole benefit of the prevention of the formation of hydrates in pressure control devices. Nonetheless, the additional advantage of uninterrupted operation of regulators might be the deciding factor in such a project when continuous transmission line operation and mitigation of internal corrosion would not suffice.

The dehydration of gases may be effected by absorption, adsorption, compression, or refrigeration. It is not meet to discuss here the relative merits of





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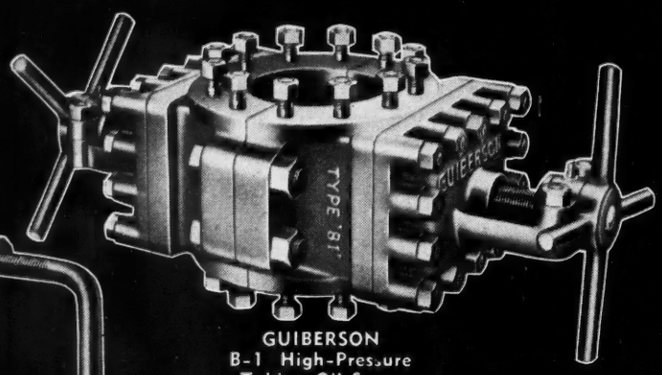
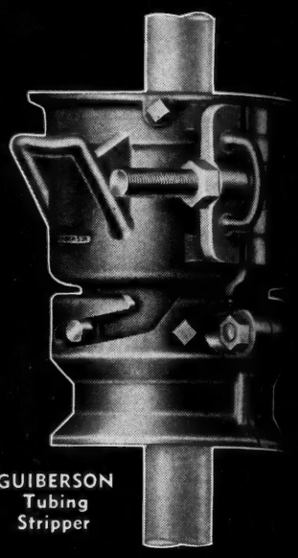


GUIBERSON
B-1 High-Pressure
Tubing Oil Saver



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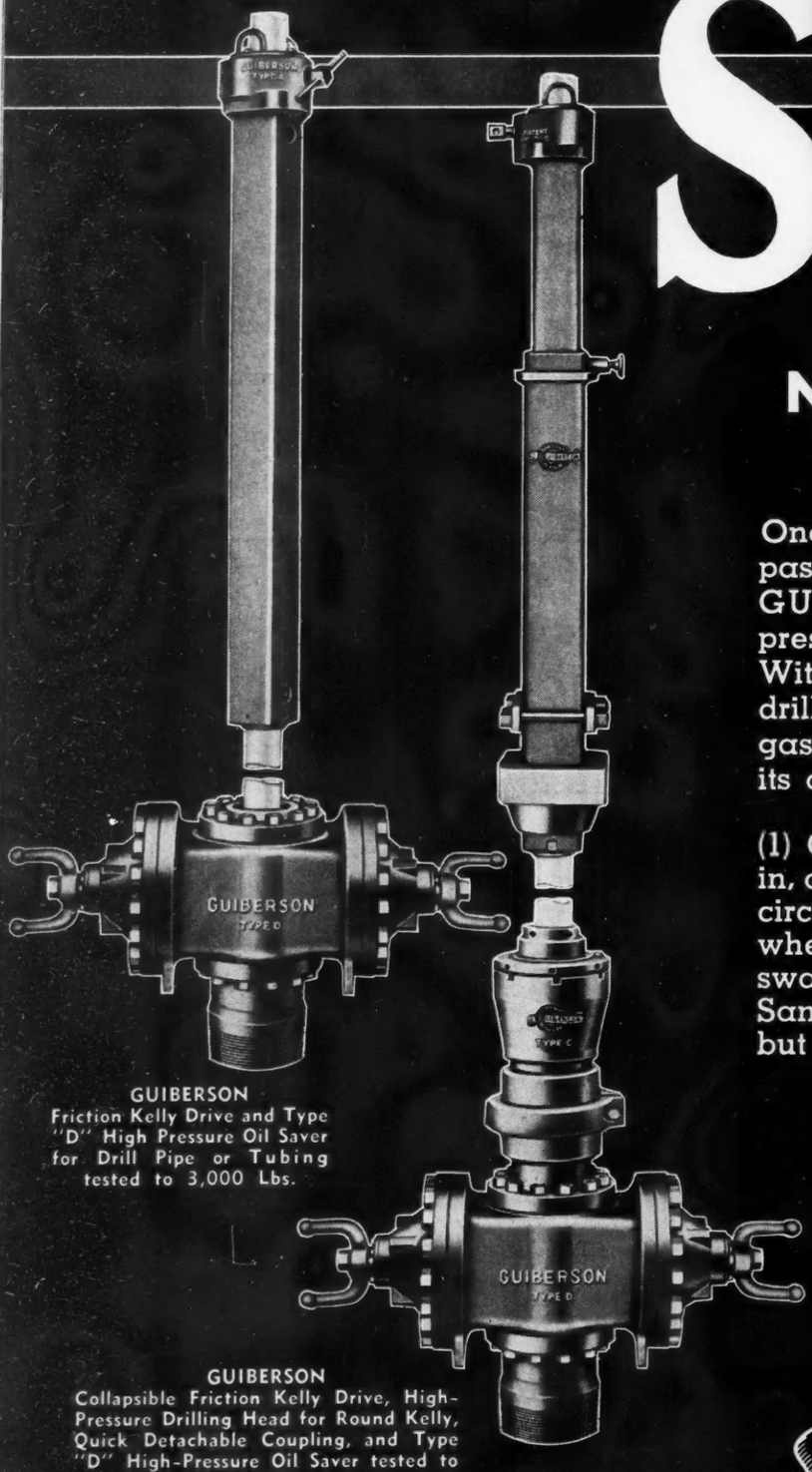

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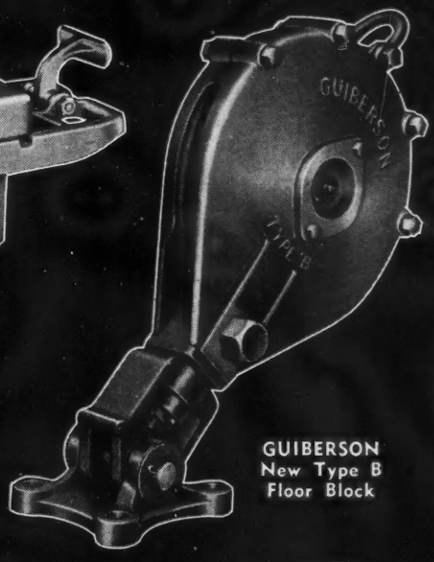

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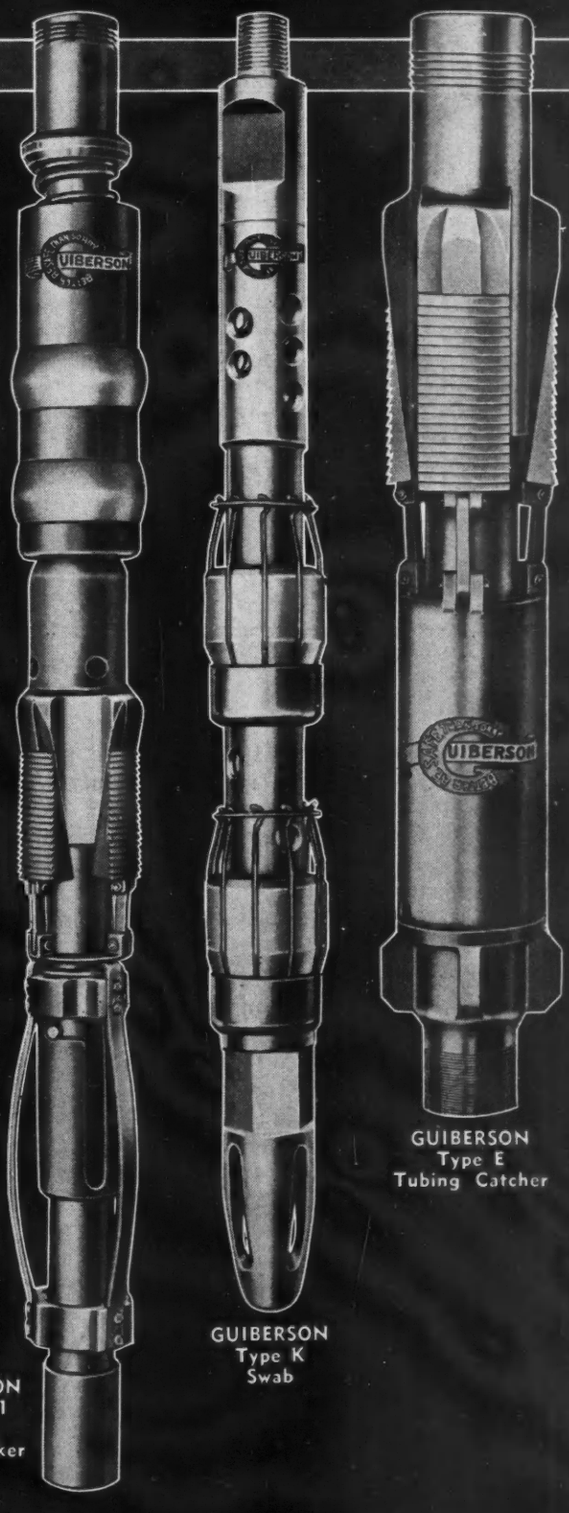

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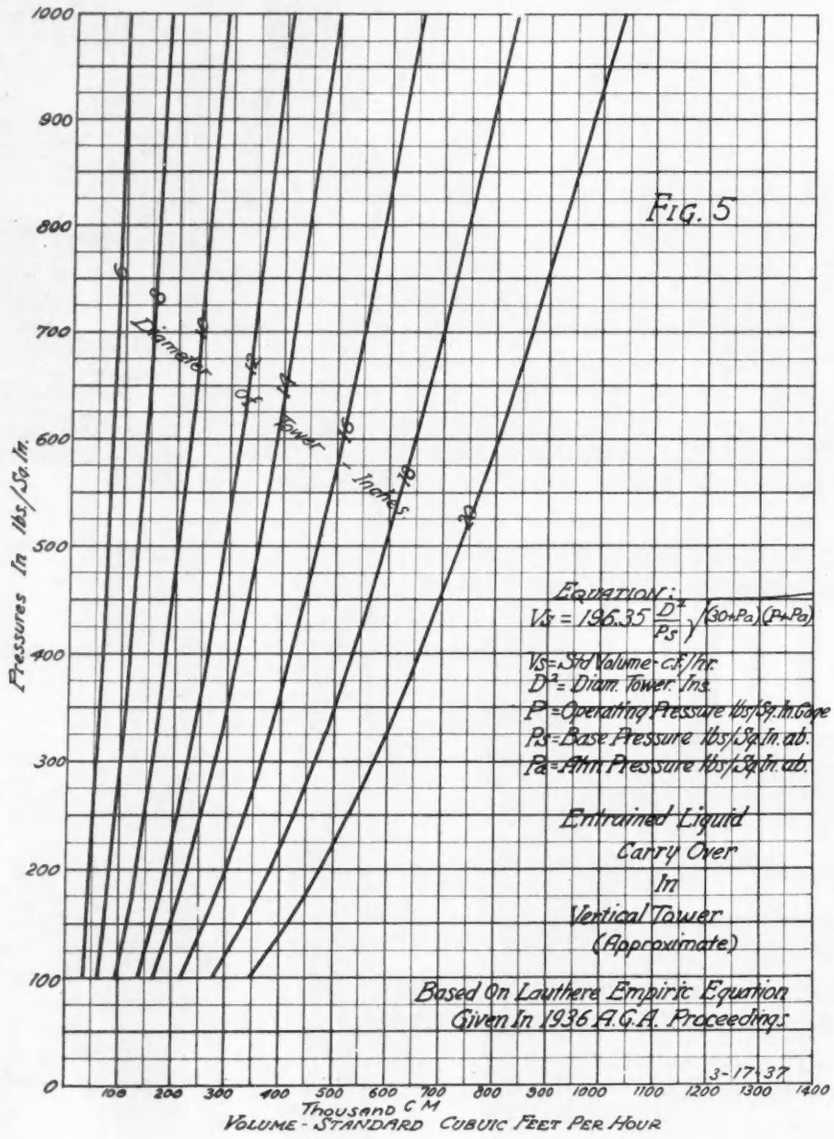
FIG. 5
Pressures In Lbs./Sq. In.
Diameter Of Tower - Inches
Equation:
Vs = 196.35 (D²/Ps) √((30+Pa)(P+Pa))
Vs = Std Volume - Cu. Ft./Hr.
D² = Diam. Tower. Ins.
P = Operating Pressure Lbs./Sq. In. Gage
Ps = Base Pressure Lbs./Sq. In. ab.
Pa = Atm. Pressure Lbs./Sq. In. ab.
Entrained Liquid
Carry Over
In
Vertical Tower
(Approximate)
Based On Lauthere Empiric Equation
Given In 1936 A.G.A. Proceedings
3-17-37
Thousand C M
Volume - Standard Cubic Feet Per Hour

the different systems, but for the purpose of preventing freezing in regulators, only the two first-mentioned schemes are applicable, inasmuch as it would be quite fantastic to conceive of a refrigeration system, much less a compression system, to increase the pressure of the gas to condense out moisture which in turn would create more work for the regulator to do.

Adsorption. There are a number of compounds, in the main being porous silicates such as silica gel, anhydrous calcium sulphate, which are physically capable of taking up water in the interstitial space of their granules. Inasmuch as it is possible to reactivate the material by application of heat with the consequent evaporation of trapped water, the equipment necessary for rejuvenation is quite often in excess of the cost of the material itself or the containers which must be provided to contact the gas when the scheme is employed on a large scale. Probably the one feature which detracts the most from a more widespread application of adsorption is the fact that the process is selective and other vapors present may be chosen rather than the water vapor. It is also true that adsorptive materials fouled by other vapors may not be completely reformed, and thus have their operating efficiency considerably reduced.

The process of testing gas for gasoline content by charcoal tube is one of adsorption. This material, incidentally, may be used to remove water vapor from gas.

Absorption. There are a great many materials or combination of materials with hygroscopic properties, and the choice of substance to be used is dependent upon the components of the gas, the price of the material to be used, the geographical relativity from the point of operations to the point of supply of the material, and the price of equipment necessary to utilize the material in water vapor extraction. In general, the lowest moisture content under a given set of temperature conditions can be obtained by chemical absorption; however, the heat evolved will be greater, which in this case is no liability, but the difficulty of regeneration if necessary is greater than for adsorption. For information on drying agents of various sorts, including such solids as phosphorous pentoxide and calcium chloride, or liquids, such as glycerine and sulphuric acid, or binary mixtures, such as ammonia nitrate and calcium nitrate, or reciprocal salt pairs, such as calcium nitrate and potassium chloride, you are referred to an article by J. H. Perry and H. C. Duus appearing in the February, 1934, issue of Chemical and Metallurgical Engineering, Volume 41, No. 2, Pages 74 to 77.

The Glacier Production Company uses anhydrous flake calcium chloride for drying gas at the well head. It might be here stated that the dehydration system was not initiated for the sole benefit of the regulators but rather to provide constant gathering line operation during the winter. It is possible to operate field regulating stations without heating the gas prior to pressure reduction as long as the dehydrators function normally; however, there are times when weather conditions may delay the visiting of the dehydrators for periodic refilling. If dehydrator efficiency drops off, then it is probable hydrates will start to accumulate in the gathering line, but the interval before complete stoppage would occur is so much longer than the time involved for the freezing of a regulator that heating of the gas is justified at regulator inlet when constancy of operation is paramount.

The initial scheme of dehydration consisted of a method wherein the gas was passed through a cylinder 20 inches in diameter by 4½ feet long

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Big brutes of valves, little baby valves. Needle valves, globe valves, gate valves, pop valves. Brass, steel, iron and alloy valves. Valves for gas, air, oil, water, steam and chemicals. Any kind of valve—the biggest valve parade on earth!

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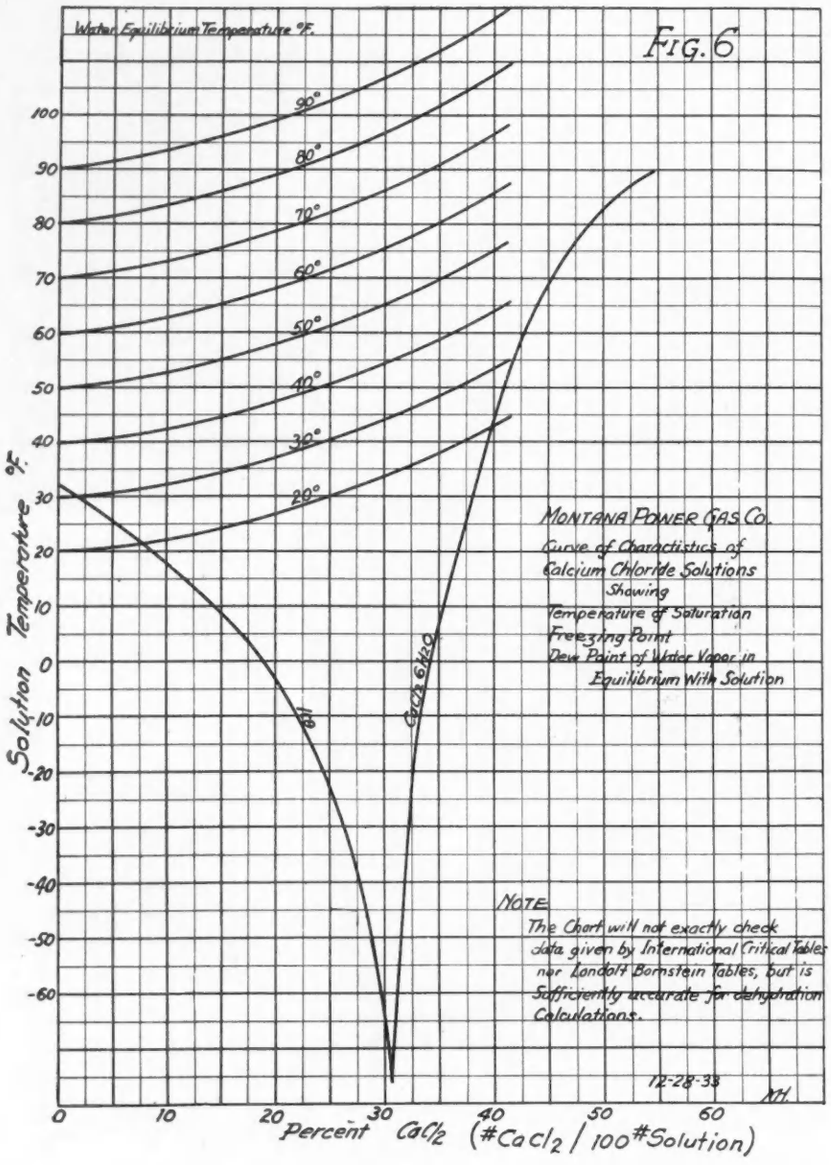

inside of which were steel wire baskets containing solid flake calcium chloride. Operation indicated that even though the pots were charged with relatively anhydrous chloride, the exterior coated with a film of water and thenceforth reacted as a concentrated solution of the salt, at normal temperatures that being a molecule of salt with six molecules of water. Eighty percent efficiency was attained when the weight of water passing was eight grains an hour per square inch of chloride exposed; this efficiency is based upon the amount of water which could be removed at the temperature of the chloride. The shape of the basket has little effect.

Further experiments evolved a bubble type dehydrator which has been in use with highly satisfactory results in that in the past winter, which has been one of the coldest on record in Montana, we only had two gathering lines freeze due to impossibility of reaching the dehydrator to fill it, and no frozen regulators. The gas enters down through an open pipe and is emitted through holes drilled in the side. Flake calcium chloride is added in the top by the removal of the Victaulic cap shown. Enough water must be added to bring the brine level up above the orifices in the incoming pipe. It is possible that when a dehydrator is not operating for the temperature to drop and so concentrate the brine as to form a $6H_2O$ phase of the salt at which time the shell will be completely plugged. This is very easily eliminated by either raising the temperature or simply adding more water to put the material in solution. As the brine absorbs water from the gas and the level rises, it surges over into the outlet and runs through the gathering line to a drip. Because of the low price of the commodity it has been cheaper to waste the resultant brine rather than haul it through snow drifts in the winter time back to a central regenerating plant, which is the only condition under which re-activation would be economic. A type of dehydrator designed to eliminate the addition of water at each filling permits the brine in the reaction chamber to be splashed up and add water of crystallization to the dry chloride resting on the plate. Figure 5 shows diameters of vertical towers and velocities in terms of volume which will not create carry over.

The worst fault of calcium chloride dehydration, and this is true of all absorption processes, is the fact that the ultimate dew points obtained are a function of the temperature of the brine. As such, the use of chloride would not be recommended in localities where low equilibrium temperatures are to be expected from high gas or atmospheric temperatures. An example of this is that the lowest dew point that can be expected from a 43° F. saturated solution, perfect equilibrium is a 20° F.

Figure 6 shows the characteristics of calcium chloride as a drying agent. For circumstances where calcium chloride is inapplicable, then glycerine or diethylene glycol are suggested, though to be economically feasible, the use of either of the above materials demands a regenerating plant.

The remainder of this article will be published in an early issue of The OIL WEEKLY

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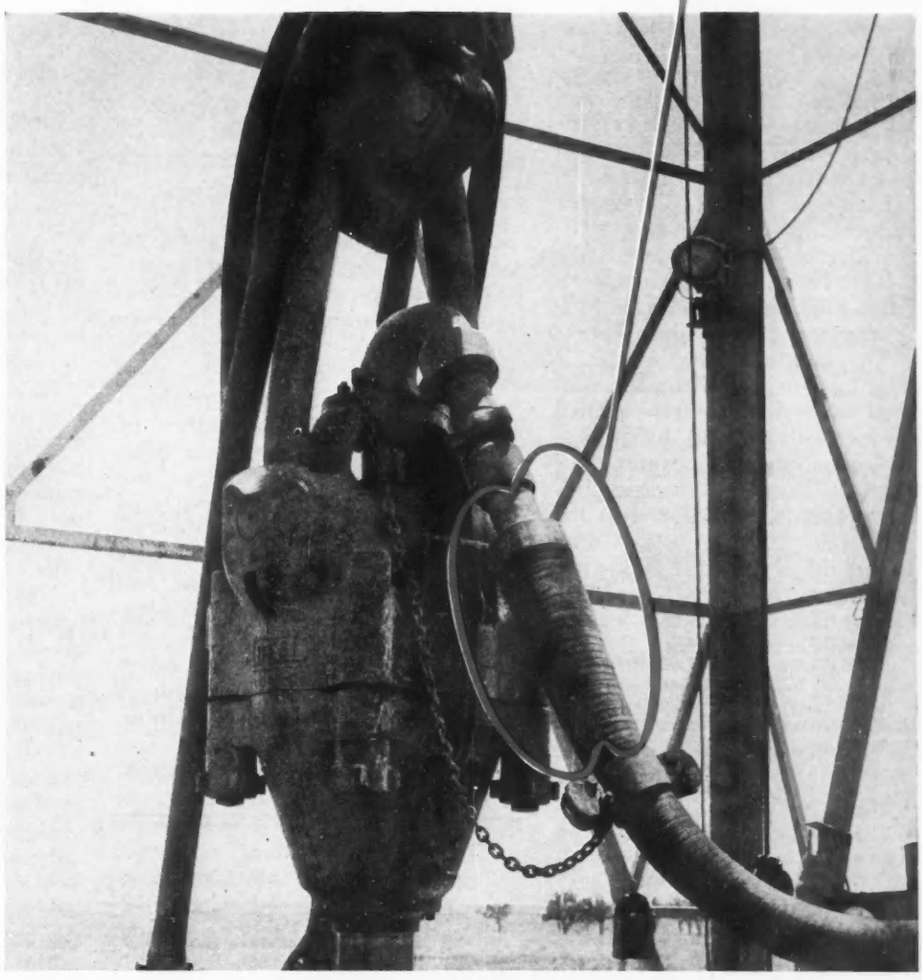

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A DESCRIPTION OF

Pressure Drilling Operations

IN KETTLEMAN HILLS AND EFFECT ON

Initial Production Rates

By FRED WINTERBURN

THIS discussion covers only one method of pressure drilling—that which was developed in the Kettleman Hills field. Thus it is probable that many departures from the procedure herein described would be advisable and perhaps necessary in using this method of drilling wells in other localities.

The author acknowledges the cooperation of O. W. Chonette of Kettleman North Dome Association, with whom he worked jointly in the original compilation and study of the data relative to pressure drilling.

Presented before the fall meeting of the Petroleum Division of the American Institute of Mining and Metallurgical Engineers, Los Angeles, Calif., October 1, 1937.

BY the early part of 1936, formation pressures in the heavily produced north end of the Kettleman North Dome field had declined to range from 1000 to 1500 pounds per square inch. This low pressure, combined with the depth of the wells (8000-9000 feet) caused water to be filtered out of the mud into the producing sands during drilling operations. The loss of water was indicated by loss of fluid from the suction tank while drilling, accompanied by an increase in mud weight. It was found that when water was added to the mud stream at such a rate as to keep the fluid level in the suction tank constant, the mud weight would not vary. This indicates that water only was forced into the sands. The rate of this loss at various wells ranged from 2 to 5 barrels per hour. In some cases complete loss of circulation occurred, and drilling mud to the extent of 200 to 1000 barrels had to be pumped into the sands before returns were regained. It was believed that these conditions already had begun to harmfully effect production, and that such effect would become more pronounced as formation pressures continued to decline.

Pressure drilling with oil was introduced because it eliminated the danger of loading the formations with mud and water while drilling. The method also afforded a convenient means of testing as drilling progressed, eliminating frequent formation testing which had become necessary because of encroaching edgewater.

Description of Operations

After drilling the first nine wells under pressure, a standard procedure was adopted.

The hole is drilled to the top of the zone to be produced, where 6⅝-inch casing is set. Pressure drilling equipment is rigged up while the well is standing cemented. After drilling out cement and obtaining approval of the water shutoff, the mud is circulated out of the hole with water, which is then replaced with oil of approximately 30 degrees A.P.I., care being taken to eliminate nearly all water from the oil before drilling ahead. Bits 5⅝ inches in diameter are used.

Oil is circulated down through the drill pipe, which is packed off above the return flow pipe while drilling, and gas is injected at the desired rate into the standpipe. A portable compressor is used to maintain pressure necessary for injection. Back pressure is maintained by manipulation of a stop cock on the return flow pipe from the casinghead. The gas injection rate is regulated by means of a valve in the compressor intake line. A check valve prevents forcing oil into the gas injection line in case of sudden increase in pump pressure.

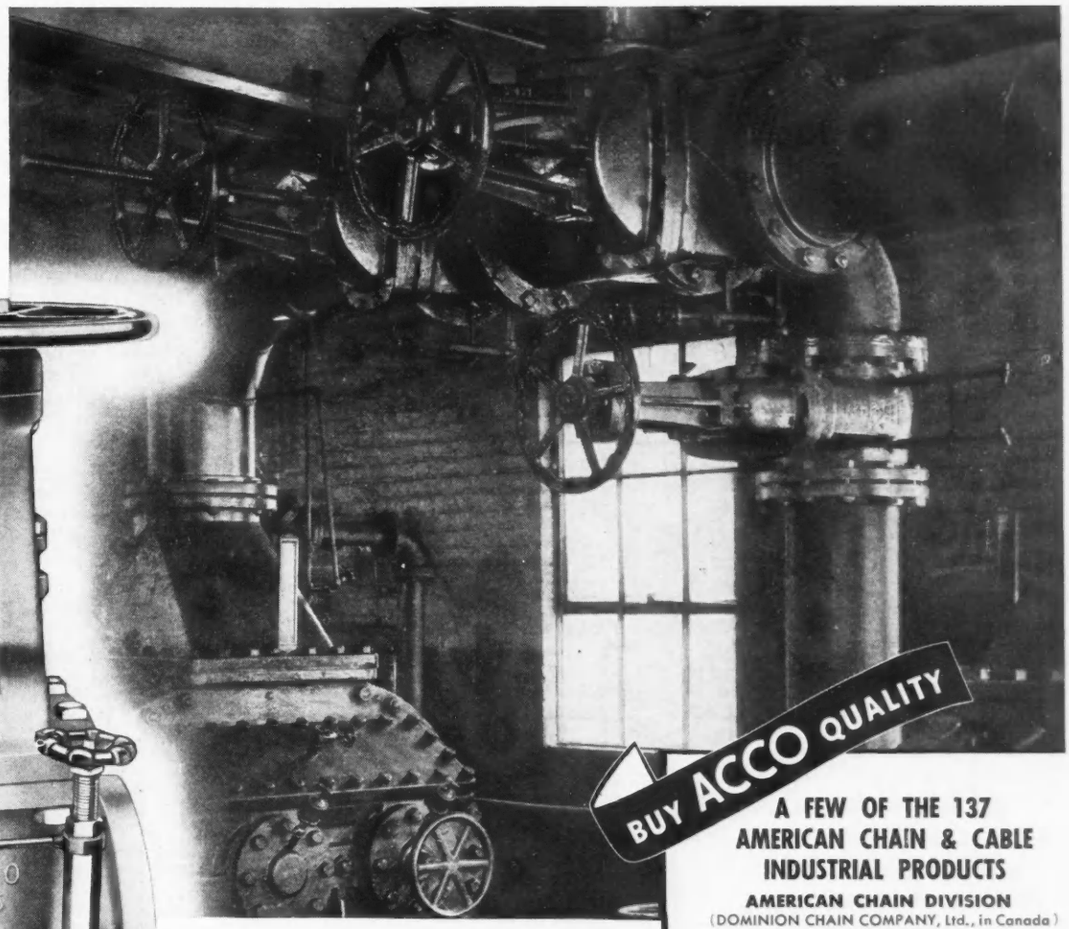
Returns from the flow pipe are run directly to a gas trap operating under 20 pounds pressure. Gas from the trap is metered, and the oil is returned to the suction tank after passing over a vibrating mud screen. The gas trap is blown down periodically to remove accumulated cuttings.

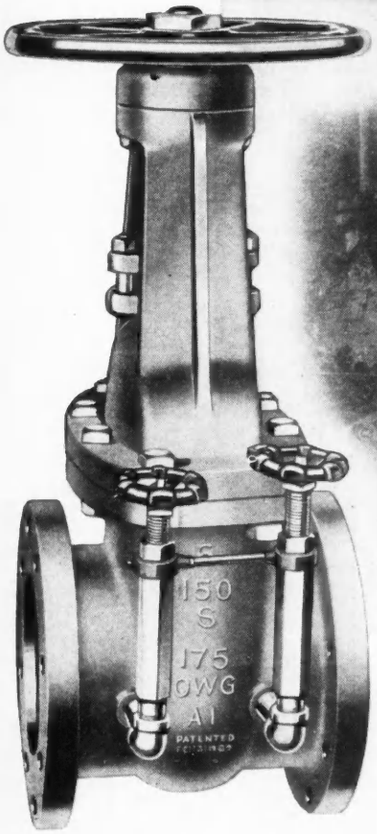
The following data are kept in hourly record form as drilling progresses: Depth, input gas rate, output gas rate, pump pressure, back pressure, gauge on suction tank, pump strokes per minute and length of stroke, compressor suction and discharge pressures, cut and gravity of drilling fluid. All additions to, and withdrawals of fluid from, the circulating system are recorded.

Meters and gauges are located in a central meter house to facilitate the recording of data, and consist of the following:

Pump pressure gauge.....	Recording
Compressor discharge pressure gauge	Recording
Back pressure gauge.....	Recording
Compressor suction pressure gauge	Indicating
Gas line pressure gauge.....	Indicating
Gas injection meter.....	Recording
Gas discharge meter.....	Recording
Meter on oil line from reserve tank to suction tank.....	Continuous register
Meter on oil line from suction tank to reserve tank.....	Continuous register
Meter on oil line from trap to suction tank..... (Used in measuring production during flow tests)	Continuous register

Before making a connection, the





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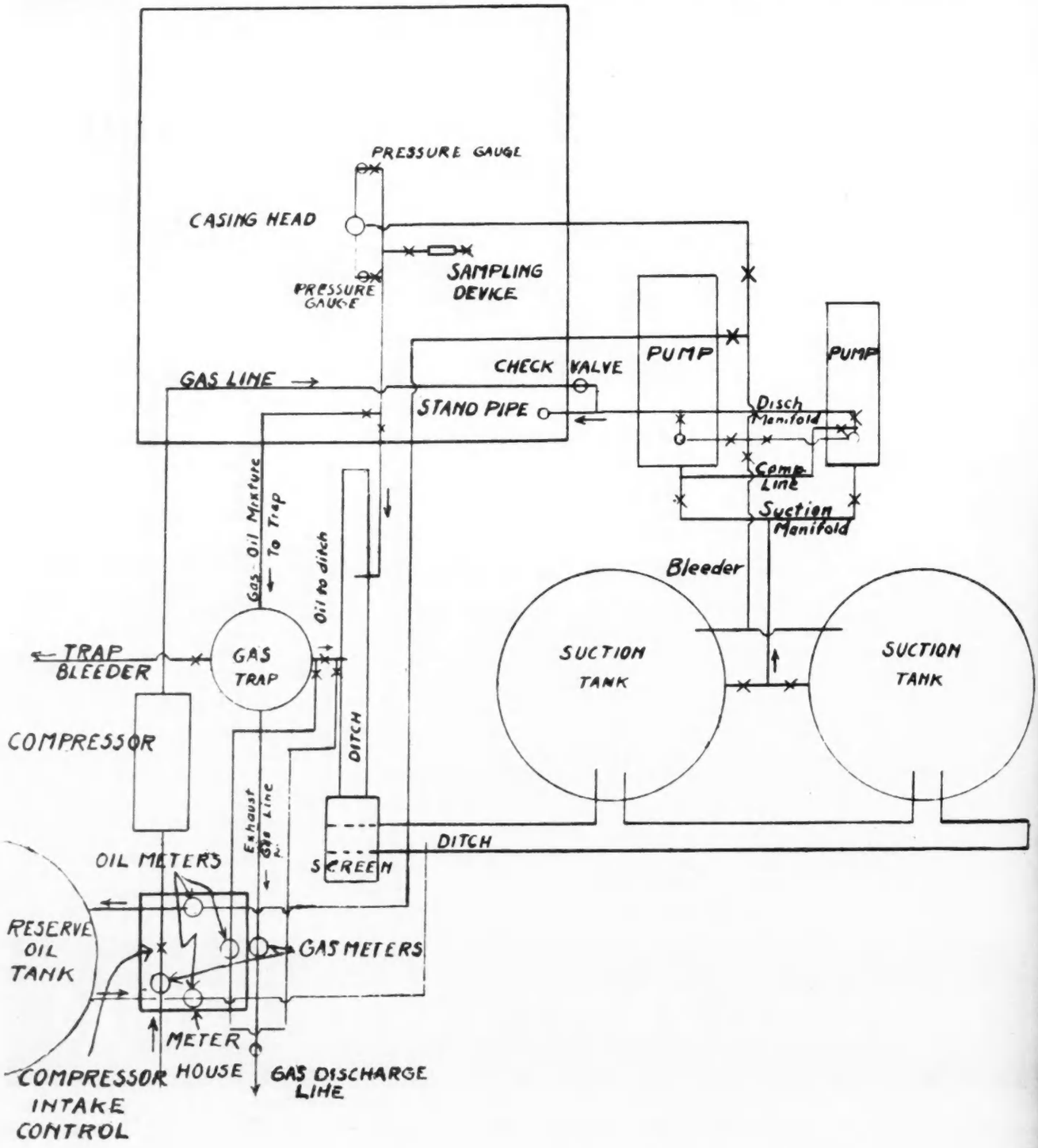
gas is shut off and the fluid circulated until most of the gas is eliminated, and cold oil pumped into the drill pipe to prevent back flow. Before making a round trip, the same procedure is followed except that sufficient cold oil is pumped into the well to prevent possibility of flow from the casing or from the drill pipe, thus eliminating the possible necessity of pulling drill pipe under pressure.

In the drilling of later wells, hydraulic rotary table with packer has been used, in conjunction with flush joint 3-inch drill pipe and a round kelly, as standard equipment. Some wells used other arrangements, viz: rotating packer with square kelly and conventional rotary table and drill pipe; also stationary packer with octagonal kelly and conventional rotary table and drill pipe. A spring-type check valve is placed in the drill pipe at a point just above the casing shoe. The purpose of the check valve is to prevent the well from flowing through the drill pipe when the kelly is removed.

Originally it was intended, if possible, to allow the wells to flow while drilling. However, in the first three wells drilled, formation pressures were comparatively low, oil used as circulating fluid was rather heavy, and a maximum of 1200 pounds pressure was available for injection, since compressors were not used. Under these conditions it was not possible to induce flow, and the procedure described above was developed. During operations there was

FIGURE 1
Piping Diagram for Pressure Drilling.



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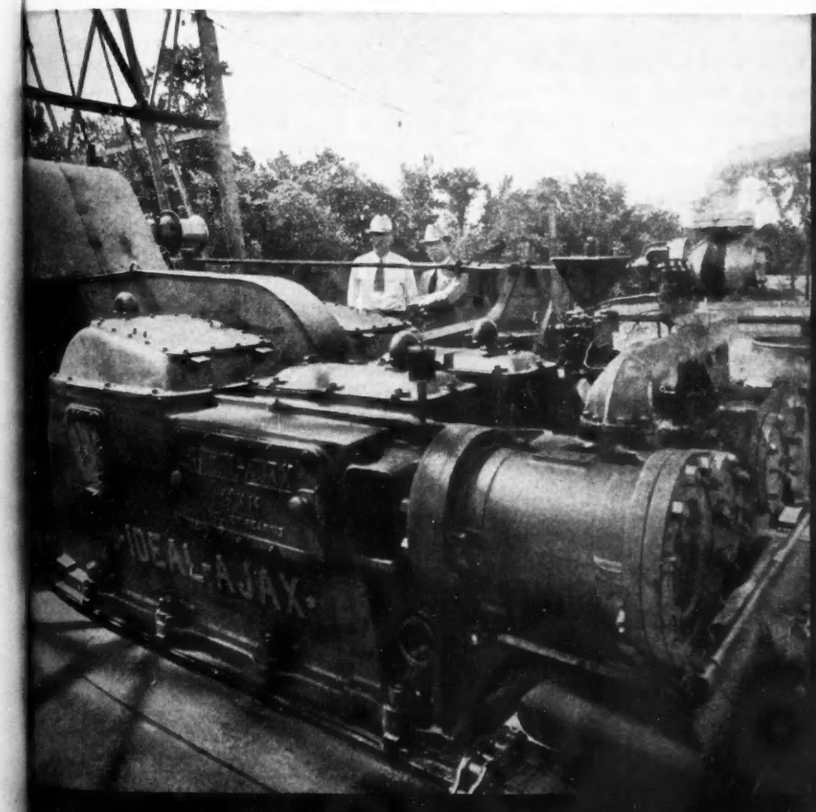

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some evidence that higher rates of gas injection caused difficulty in keeping the hole in condition, possibly due to the surging and heading of the circulating fluid. Heading also was the cause of "stacking" considerable oil at times when the fluid rate through the gas trap exceeded the capacity. For these reasons, in later wells where conditions were such that it may have been possible to induce flow while drilling, no attempt was made to do so.

Arrangement of the gas lines, oil lines, meters, and other facilities is illustrated in Figure I.

The procedure that has been described, as well as the equipment used, underwent changes as experience was gained in drilling by this method. The first four wells were drilled with hydraulic rotary table, packer, flush joint drill pipe and round kelly. Snubbing rams were found to be unnecessary with the comparatively low pressures encountered. Following this, a rotating packer was used on one well, in conjunction with a square kelly and conventional rotary table and drill pipe.

The next two wells were drilled with stationary packers, octagonal kelly, conventional rotary table and drill pipe. * * *

Use of a vibrating screen was instituted at the fifth well drilled, in order to aid in removing cuttings from the fluid and preventing material being pumped down the drill pipe which might plug the check valve.

The check valve was placed in the drill pipe at various intervals above the bit. It was finally decided to place it at a point just above the casing shoe, so that it would not interfere with possible fishing jobs. Substitution of a spring-type valve for the flapper type used originally, greatly reduced difficulties due to plugging the valve.

While the first six wells were being drilled, pressure on gas lines throughout the field was maintained at 1200 pounds, and injection took place directly from the gas line. However, after this time the gas line pressure was reduced to 800 pounds and it became necessary to use portable compressors. Available pressure when using compressors was 1750 pounds per square inch. The higher available pressure proved more satisfactory because it had previously been necessary at times to slow the pumps down in order to reduce the pump pressure below 1200 pounds.

At the ninth well drilled, and all wells drilled thereafter, all meters and gauges were placed in a central meter house to facilitate recording of data. * * *

Testing

When a depth is reached at which it is desired to test, the drill pipe is hung just above the casing shoe or near the bottom of the hole. The gas rate is gradually increased, and the pump simultaneously slowed down until completely stopped, and the well thus brought in, flowing through the casing on gas lift. In case the well has sufficient pressure, the gas is eventually shut off and the test completed under conditions of natural flow. After the well has produced for a sufficient period to remove all drilling fluid from the hole, rate of flow is determined by meter readings and gauges in the suction tank. Test periods vary from 8 to 24 hours. The amount of water is determined by bleeding the suction tanks each time they are filled. Two suction tanks permit continuous gauging, the oil being pumped to the reserve tank from one suction tank while the other is being filled. All output and input gas is metered. Tests for cut and gravity are run frequently on flow line and gauge tank samples. Samples of any water produced are saved for analysis.

Although it is desirable to hang the drill pipe near the bottom of the hole while testing, in order to prevent bridging, the bit is generally hung just above the casing shoe in cases where there is considerable open hole, because of the danger of sticking the drill pipe.

When it is impossible to lighten the fluid column sufficiently to start the well flowing with the bit at the casing shoe, the drill pipe is pulled up to a depth at which the fluid can be gas-lifted from the hole, and is then lowered in stages and the fluid lifted from the hole at each stage until the hydrostatic head has been sufficiently reduced to permit the entrance of fluid from the formation. The test is then conducted as described above.

Drilling Time

Rock bits were used exclusively in drilling. All hole made was 5⅝-inch with the exception of 125 feet of 8½-inch hole. Average drilling rate with oil was 5.63 feet per hour, compared with 4.2 feet per hour when drilling the same size hole with mud. Average footage drilled with each bit when drilling with oil was 63 feet, compared with 31 feet when using mud. Unfortunately, the total footage of 5⅝-inch hole drilled with mud is small, and the figures used in this comparison may not be representative.

Such time as is saved by reason of increased drilling rate and fewer round trips is probably compensated for by the time consumed in circulating before making connections and round trips. In some cases also more than the normal four-day period of standing cemented was necessary for rigging up the hydraulic rotary table and other special equipment.

Fishing Job and Condition of Hole

As might be expected, considerable difficulty has been encountered in keeping the hole open in some of the wells having 300 to 400 feet of open hole. The factors that probably influence the condition of the hole are as follows:

1. Amount of hole drilled.
2. Formation of cake on walls of hole by mixture of circulating fluid and cuttings.
3. Formation.
4. Gas rate.
5. Oil rate.
6. Cut and gravity of circulating oil.

The drill pipe was stuck in two wells. The first string was freed almost immediately. However, in the next case it was necessary to sidetrack the stuck drill pipe and 23 days lost time resulted. All fishing and sidetracking operations were conducted with oil in the hole, and the well was finally successfully completed with oil.

In those wells in which only approximately 100 feet of hole was drilled, no trouble of any kind was experienced. No difficulties were encountered in any of the wells drilled until more than 100 feet of hole had been made. This suggests that bridging may have been due, at least in part, to failure to completely remove cuttings from the hole, and that overloading of the fluid with cuttings did not occur until more than 100 feet of hole had been made. This belief was strengthened when, after pulling a plugged bit in one well, the drill collar was found to be filled with what apparently were very fine cuttings. At another well where several cores were taken, it was found that unless each joint of drill pipe was circulated down in the lower part of the hole, the inner barrel would become plugged with an oily sludge of fine cuttings.

Some cores were coated on their outer surfaces with a material resembling a mud filter cake which apparently consisted of a mixture of oil and fine silt particles. It is possible that similar material deposited on the walls of the hole may be a factor in the prevention of caving and bridging. * * *

Pressure drilling was abandoned in

one well when serious caving started after a bed of hard brittle shale had been penetrated. This particular horizon was not penetrated by any other well while drilling with oil.

It is believed that gas injection aids in carrying cuttings to the surface through increased velocity of flow and possibly also through the buoyant effect of gas bubbles adhering to the cuttings. However, in the data available there is some evidence that too high rate of gas injection may have a harmful effect on the condition of the hole. This is probably due to the surging and heading of the fluid which generally occurs with increased gas rates.

Too low a rate of pumping fluid naturally would result in incomplete removal of cuttings from the hole. Of course the pumping rate and the gas injection rate are closely related, and it is their combined effect which carries cuttings out of the hole. At those wells which had only 1200 pounds available gas pressure it was sometimes the case that pressures greater than 1200 pounds were needed to pump oil at the desired rate. Consequently, it was necessary to reduce the rate of pumping oil in order to inject gas. After compressors were used, and the available gas pressure raised to 1750 pounds, this difficulty was eliminated. At some wells pumps were incapable of operating at increased pressure which generally occurred soon after gas injection was started and before the fluid became equalized inside and outside the drill pipe. It was found that by using pumps capable of working against pressures of at least 1500 pounds, and maintaining 1750 pounds available gas pressure, the rates could be adjusted as desired without difficulty.

The water content of the oil used in drilling has been found to have a direct effect on the condition of the hole. Sump oil was generally used as circulating fluid in most of the first eight wells drilled. At one well having 437 feet of open hole, trouble was experienced in keeping the hole open. The oil in the hole was found to contain 30 percent water in emulsified form. Prior to this, checks on the water content had not been made at all wells. It is thus possible that excessive water in the circulating fluid was the cause of trouble at other wells.

After discovery of this apparent connection between water content of the drilling fluid and condition of the hole, clean oil was used as circulating fluid and regular tests for water content were made while drilling.

Six wells were drilled after this practice was instituted. Only one of these had serious trouble with bridging and caving of the hole. At this well the water content increased suddenly before trouble started. It was found that a leak had developed in a connection to the hydraulic packer. The fluid in the hole was replaced with clean oil, and the hole thereafter drilled to completion without further trouble. This seems definitely to establish the fact that use of clean oil is an important factor in keeping the hole in condition.

Underreaming prior to running the liner greatly increased bridging in one well. All subsequent wells were completed without underreaming.

As a result of the experience gained and study of the records of the various wells, the following practices have been adopted because they seem to produce the most satisfactory results:

1. Water content (whether free or emulsified) of the oil to be used in drilling is reduced to 2 percent or less before drilling is commenced.
2. Oil is pumped at a rate of 3 barrels per minute or more while drilling.
3. Gas injection rate is maintained at approximately 200 Mcf. per day.
4. Back pressure on the casinghead is kept at about 50 pounds per square inch.

As is apparent, the above procedure was decided on as a means whereby the desired objects could be attained with a minimum of danger of getting into costly fishing jobs.

It is probable that many of the wells could have been flowed while drilling. In the producing formations, however, individual oil sands are sometimes separated by 70 or 80 feet of barren sediments. It was feared that in drilling through these barren intervals without circulation through the bit, the drill pipe might be stuck since there would be no movement of fluid below the lowest oil sand penetrated. For this reason periodic testing was relied upon to furnish information as to productivity, and presence of water.

Setting Liners

Four and three-quarter inch flush joint perforated liners were landed in all wells. The first well in which a liner was run had only 90 feet of open hole, and the liner went to bottom without difficulty. The next well had 347 feet of open hole, and in the first two attempts to run the liner the 4¾-inch stopped on bridges. Following this, a diamond point bit was attached to the bottom of the liner, and 2-inch washpipe and pack-off assembly placed inside the liner so that fluid could be circulated through the bit. With this arrangement the liner was successfully run to bottom. This became standard practice on all wells, although in some cases the liners went to bottom without circulating or rotating.

Completion of Well

After landing the liner, the tubing is hung at the desired depth, the pump started, and gas injected. The pump is slowed down as the gas rate is increased. Finally the pump is completely stopped and the well is brought in on gas lift through the casing. If the well pressure is sufficiently high, the gas is finally shut off and the well allowed to flow naturally.

Summary of Operations

To date pressure drilling with the use of oil and injected gas as circulating fluid has been used at 14 wells. Of these, 12 were placed on production; pressure drilling was abandoned at one well after a caving shale bed had been drilled through, and one well was deepened and completed with mud after the zone drilled with oil had been tested and found to be wet.

A total of 4088 feet of hole was drilled in the 14 wells, 3963 feet of which was 5⅝-inch and the remaining 125 feet 8½-inch. In drilling the 5⅝-inch hole an average of 63 feet was drilled with each bit, at an average rate of 5.63 feet per hour. In one well in which more than 500 feet of 5⅝-inch hole was drilled with mud, the corresponding averages were 31 feet per bit and 4.2 feet per hour. Only 53 feet of hole has been cored with oil. Average rate while coring was 3.3 feet per hour.

Maximum amount of hole drilled in any well was 463 feet, and the minimum 90 feet.

Nine of the wells drilled encountered no unusual difficulties. The remaining five wells experienced serious trouble with bridging and caving of the hole, which was the cause of considerable lost time. At one of these five wells a string of drill pipe was stuck, and 23 days consumed in fishing and sidetracking.

It is significant that only one of the last six wells drilled has had difficultiy with the condition of the hole, and in this well, as has been previously described, the trouble was directly attributed to the contamination of the drilling fluid with water from

a leaky connection to the hydraulic packer.

The elimination of hole trouble coincided with the adoption of the standard procedure of using clean oil as circulating fluid, maintaining the rate of pumping oil at from 3 to 4 barrels per minute, the rate of injecting gas at approximately 200 Mcf. per day, and holding 40 to 60 pounds per square inch back pressure on the casinghead. It is thought that the most important single factor is the use of clean oil as circulating fluid.

A consideration of the above summary leads to the conclusion that it is possible to drill and complete wells in Kettleman Hills, using this method of pressure drilling, with no more trouble than is to be expected when drilling with mud.

Comparison of Production Rates

Evaluation of comparative production data is difficult because the mechanical conditions, method of producing, gas/oil ratio, bottom hole pressure, amount of producing formation, and character of the producing formations vary from well to well.

In the comparison of initial production rates of wells drilled with oil with those of wells drilled with mud, wells were chosen in the same area, at the same structural position, and with all other conditions as nearly the same as possible. The accompanying tabulation shows the comparative initial production rates of wells drilled with oil and wells drilled with mud, together with all pertinent data as to conditions under which the wells were produced, bottom hole pressures, amount of open hole, etc. In all except one case the well drilled with mud was completed prior to the well with which it is compared.

It will be noted from the tabulation that all the comparisons except "V" show a greater rate of oil production for the wells drilled with oil than for those drilled with mud. The production rates shown in these comparisons are the maximum rates in the early lives of the wells, and further study as the wells continue to be produced will be necessary to determine if the use of oil as circulating fluid will result in greater ultimate production. In comparing these data it should be borne in mind that while information is not available as to the porosity and permeability of the producing sands in the different wells, these factors undoubtedly have a marked effect on productivity. The only clue to these values in the tabulation is found in the productivity factor or barrels per day per pound drop of bottom hole pressures while flowing. These values ordinarily will be smaller in cases where the sands are lower in porosity and permeability. The fact that the wells drilled with oil have a higher average productivity factor than those drilled with mud suggests that the method of drilling may have an effect on this factor.

Comparison "I" shows a very marked advantage for the well drilled with oil. However, although data on Zone III pressures after completion are lacking for Well 1-B, information obtained from this well during a test prior to the completion of the well shows an oil rate of 414 barrels per day with a shut-in bottom-hole pressure of 1255 pounds per square inch, compared with 1726 barrels per day in Well I-A with a shut-in bottom-hole pressure of 1390 pounds per

Comparison of Production Data of Wells Completed With Oil and With Mud

Well No.	Drilled With	Zone	Amt. of Open Hole	Date Completed	MAXIMUM DAILY PRODUCTION								BOTTOM-HOLE PRESSURE					
					Hot Oil (Bbls.)	Water	Form. Gas	Circ. Gas	Cat.	Grav.	T.P.	C.P.	Bean	Date	Shut-in Pressure Mid-Point of Perforations	Oil Rate	Prod. Factor* Oil	Prod. Factor* Oil & Water	G/O Ratio Cu. Ft. Per Bbl.
Comparison No. I																			
I-A	Oil	III	90′	5-12-36	1726	..	4000	None	90.0	28.4	560	50	1-C 128/64	5-25-36	1390	725	0.92	1.06	2757
I-B	Mud	III	92′	†3- 9-36	414	..	640	None	0.4	34.7	20–60	Packer	1-T						
				4-28-36	151	..	372	None	2.0	34.1	8	380	128/64	3- 9-36	†1255	452	5.08	...	1400
Comparison No. II																			
														8-12-36	1230	1150	8.85	...	1706
II-A	Oil	V	347′	7-24-36	3150	..	4650	None	5.0	34.7	480	200	1-C	11-22-35	1120	1300	8.66	...	1478
													160/64	11-26-36	1120	690	6.27	...	1703
													1-C						
II-B	Oil	V	437′	1-10-37	3854	..	2501	837	0.1	32.8	670	100	128/64	.....	‡1490	....	....	...	....
		Upper ¾											1-C						
II-C	Mud	of V	231′	5- 5-36	2540	..	4580	None	0.2	34.2	100	110	128/64	5-10-36	1375	1504	0.14	...	1278
													1-T						
													128/64	11-22-36	1120	509	6.66	...	1764
Comparison No. III																			
														9- 8-36	1200	1392	18.6	...	1140
III-A	Oil	V	463′	6- 7-36	1969	..	1863	277	0.3	35.6	140	840	1-T	9-12-36	1200	568	10.3	...	1324
													128/64	12- 9-36	1170	1130	8.2	...	617
		Test on	Open Perf.																
III-B	Mud	V	424′	4-14-36	1195	18	8130	None	0.2	38.0	460	960		4-16-35	1124	1510	5.1	...	5280
Comparison No. IV																			
		Lower ¾											1-C	9-13-35	1050	1607	11-5	...	732
IV-A	Oil	of III	135′	9-10-36	1643	..	1061	1258	0.2	37.0	160	720	112/64	1-20-37	1025	1426	4.52	...	627
		Lower ⅜											1-T	5 14-36	1090	1360	3.69	...	770
IV-B	Mud	of III	112′	5-11-36	1364	..	1053	646	0.2	36.6	115	600	128/64	6- 9-36	995	979	4.55	...	2170
														2- 6-37	655	828	2.76	...	3717
Comparison No. V																			
														12-15-36	1170	1069	2.14	...	1340
V-A	Oil	V	428′	12-10-36	1269	11	1421	735	0.4	36.3	485	145	1-C	12-17-36	1170	1111	2.36	...	1150
													128/64	12-19-36	1170	428	1.71	...	1425
		Top ½																	
V-B	Mud	Lower 7/10 V	461′	4-20-36	1836	9	1534	?	..	....	150	925		4-22-36	1380	1863	7.45	...	840
														4-24-36	1380	980	5.60	...	718
Comparison No. VI																			
		Lower ⅜											1-C						
VI-A	Oil	of V	311′	1-30-37	681	..	1318	1552	0.2	38.2	440	160	128/64	2- 3-37	1145	455	0.72	...	1021
		Lower ⅝																	
VI-B	Mud	of V	310′	5-10-36	576	10	1228	None	..	....	125	Packed off							
Comparison No. VII																			
													1-T						
VII-A	Oil	V	331′	5-30-37	1863	2	2824	None	..	33.1	135–100	500	128/64	7- 7-37	1105	1520	5.5	...	1462
													1-T						
VII-B	Oil	V	336′	3-30-37	1530	1	2583	None	..	35.8	160	670	128/64			(Data not available)			
		Zone V and											1-T						
VII-C	Mud	top finger of zone IV	315′	7- 6-37	1050	..	2005	None	0.5	34.4	125	750	128/64		1110	978	1.95	...	2296

* Barrels per day per pound drop of pressure at mid-point of perforations.
† This production rate obtained during test prior to completing well.
‡ The first bottom hole pressure reading after completion was 1610 lbs., but this is considered to be in error

square inch. It does not seem that this difference in bottom-hole pressures could account for the great difference in productivity. The low productivity factor at Well I-A suggests that the sands here are of low permeability. Further work was done at Well I-B with mud fluid and water in the hole before the completion of the well at the rate of 150 barrels per day. This demonstrates that the use of mud or water as circulating fluid is injurious to the productive sands.

Well II-B, in comparison "II," shows a considerably higher rate than Well II-C, but this difference may be in part due to higher shut-in bottom-hole pressure, greater amount of producing formation, and use of the gas lift in Well II-B.

The comparison of II-A and II-C in "II" is much more significant since II-A, with a shut-in bottom-hole pressure of 1230 pounds per square inch and flowing through tubing only, produced at a higher rate than II-C with a shut-in bottom-hole pressure of 1375 pounds per square inch, flowing through both casing and tubing with only 100 pounds per square inch back pressure. The greater amount of formation open in II-A should not entirely compensate for these advantageous conditions in II-C. The productivity factors for the two wells are nearly equal.

Comparison "III" does not indicate much better productivity for III-A because, although the oil rate is higher than in III-B, the latter well produced a much greater volume of gas, had a slightly lower shut-in bottom-hole pressure, and was flowing against more back pressure. The higher productivity factor for III-A is largely due to the difference in gas volume.

IV-A shows a marked superiority to IV-B in comparison "IV" since it produced about 20 percent more oil with a lower shut-in bottom-hole pressure. This may be due in part to the greater amount of formation open in IV-A. However, the amount of oil sand open in the two wells is about equal. The additional open hole in IV-A is barren sand between the 6⅝-inch casing and the top of the oil sand. The decrease in productivity factor in IV-B is due to increase in the volume of gas.

Comparison "V" shows an advantage in oil rate for V-B, which was drilled with mud. However, this may be largely due to a considerably lower shut-in bottom-hole pressure in V-A; also the low productivity factor in V-A indicates that the sands are tight at this location, and in addition it was necessary to spot 40 barrels of mud in the hole during a fishing job.

VI-A shows a slight advantage in oil rate over VI-B in comparison "VI." This may be due to the fact that VI-A was being produced with the gas lift. The productivity factor indicates low permeability in the producing sands in this well, but bottom hole data for VI-B are lacking.

In comparison "VII" all wells compared flowed naturally at the rates shown, and all other factors were very nearly equal except that the well drilled with mud was completed three months later than those drilled with oil. Well VII-A has a higher productivity factor than the well drilled with mud.

Of the eight wells drilled with oil which show greater production than those drilled with mud, five definitely have no advantage in pressures or producing conditions, indicating that the increased production rates are due to pressure drilling. In the other three, the pressures, producing conditions, and gas volume favor the holes drilled with oil, and may explain at least in part the difference in production.

Although comparison "V" shows smaller production for the well drilled with oil, this well V-A, had a lower shut-in bottom-hole pressure and a lower productivity factor (indicating less permeable sands) than V-B. These two conditions, and the spotting of mud during a fishing job, evidently more than offset, in this particular case, the advantage of the use of oil as a circulating fluid.

In the foregoing comparisons nine wells drilled with oil and seven wells drilled with mud are used. The average production rates, shut-in bottom-hole pressures, gas/oil ratios, productivity factors, and amounts of hole open to production of the two groups of wells are as follows:

	Wells drilled with oil	Wells drilled with mud
Production rate..	1965 B/D	1279 B/D
Shut-in pressures at midpoint of perforations ...	1222 lb./sq. in.	1222 lb./sq. in.
Productivity factor	6.90	4.43
Gas/oil ratio.....	2466 cu. ft./bbl.	2204 cu. ft./bbl
Hole open to production	320 feet	280 feet

Of the nine wells drilled with oil, five were produced on the gas lift while only two of the wells drilled with mud were so produced. However, comparison of average rates of flowing wells shows a greater advantage for wells drilled with oil than does comparison of the average rates of the two groups as a whole:

	Flowing Wells	Gas Lift Wells
Average prod. of wells drilled with oil	2067 B/D	1883 B/D
Average prod. of wells drilled with mud....	1150 B/D	1600 B/D

Two of the three wells drilled with oil which are not used for comparative purposes have been omitted because no nearby wells in the same zone were drilled with mud within the two years prior to their completion. In the third well, only the lower portion of the zone produced was drilled with oil and it was considered that it would not be indicative of the results to be expected if pressure drilling had been used through the entire zone. The average production of these three wells was 1715 barrels per day, and their inclusion in the computation of average initial production would have reduced the rate from 1965 to 1902 barrels per day for wells drilled with oil.

This analysis of the production data for the wells drilled under pressure with oil and injected gas indicates a decided advantage in initial production rates in wells so drilled over comparative wells drilled with mud. The average values of various factors affecting production excepting productivity factor for the two groups of wells used in the comparison are nearly equal, suggesting that the higher initial rates for the wells drilled with oil are due principally to the method of drilling.

If, as suggested, the value of the productivity factor is influenced by the method of drilling, the difference of the two groups of wells in this respect can not be used to discount the higher average production rate of the wells drilled with oil. The presence of mud and water in the sand increases the resistance to the movement of oil and gas into the well. This has the same effect as decrease in the permeability of the sand and would result in a lower productivity factor. Therefore it seems reasonable to consider that the higher value of this factor for wells drilled with oil is a result of the method used in drilling.

The average amount of open hole is 14.3 percent greater for the wells drilled with oil than for the wells drilled with mud. However, since the advantage in production rates is 53.6 percent, it can not be accounted for by the difference in average amount of open hole.

Further study of production data as the wells continue to produce will be necessary to determine whether wells drilled under pressure with oil will yield greater ultimate production than those drilled with mud.

It is reasonable to expect that the advantage of drilling under pressure with oil and injected gas will become more pronounced as formation pressures continue to decline.

Spacing of Oil Wells

By LYNDON L. FOLEY
Consulting Petroleum Engineer

THE proper spacing of oil wells is a problem of vital importance to the oil industry, and one of great complexity. Conservation demands a maximum recovery, while economic considerations attach primary importance to profitable extraction of oil. Formulas[1-4] have been evolved which attempt to solve the spacing problem mathematically, using reservoir characteristics as factors. Comparisons have been made of fields producing from supposedly similar sands which have been drilled to varying densities[5, 6] and also of different leases in the same field.[5-8] Intermediate wells have been drilled in old depleted fields to test the efficiency of drainage by the original operation.[9-11] Intermediate wells have been drilled also to obtain cores of the depleted sand in order that core analyses might show the degree of efficiency of extraction. The problem is being attacked by many students, and along several different lines.

Unfortunately, the fields now depleted were produced generally without restriction, and conclusions drawn from such fields may not apply to fields operated under restricted production. Reservoir conditions in a restricted field, especially reservoir pressures and pressure gradients within the reservoir, are quite different from those in a field produced to capacity.

Many people have held the idea that the closer the spacing, the greater the recovery. This general statement is not always true, as other factors than well spacing enter into the recovery problem. Cutler,[5] who has been quoted frequently by advocates of close spacing, limited his conclusions to gas-drive fields and to the particular fields and spacings that he investigated. Hill and Sutton[7] analyzed four tracts in the Powell field; the tract most closely drilled had the third largest recovery per acre-foot, and the tract with the widest spacing had the second largest recovery per acre-foot.

The general statement is not true of fields under proration, as was shown by Suman[12] and by Cattell and Fowler.[13] It may be especially untrue in prorated fields in which minimum production allowances are applied. The total of the minimum allowances of the wells may exceed the most efficient rate of production for the field. For example, if the East Texas field were drilled to a density of 1 well to 3 acres, with a minimum allowance of 20 barrels per well per day, the allowable production of the field would be approximately 840,000 barrels per day. Wilde[14] and Schilthuis and Hurst[15] have shown, and field experience has proved, that such a rate of withdrawal from the field would cause waste of reservoir energy and would decrease the ultimate recovery. A search of the references to well spacing in the publications of the United States Bureau of Mines[5, 13, 16-21] discloses repeated condemnations of the wastefulness of the practice of town-lot drilling.

The oil in a natural reservoir may be classified as Original Oil in Place:

A. Oil that adheres to the reservoir rock.
B. Oil capable of moving, or *recoverable oil.*
    1. Recoverable oil left in the reservoir.
    2. Oil that is recovered:
        a. By natural drive.
        b. By artificial drive.

It is known generally that 100 percent recovery is never achieved. A certain amount of oil remains in the reservoir rock and is not recovered, even by the most efficient water drives of our experience. All the oil that is capable of moving out of a given unit of reservoir rock is recoverable oil. The oil that is moved into the well bore is the oil that is actually recovered, and may be only a fraction of the recoverable oil. Our experience with secondary recovery methods has shown that much of the recoverable oil has been left in the reservoirs in the past. Oil is moved into the well bore by reservoir energy and, when the reservoir energy is exhausted, oil ceases to move. The addition of artificial reservoir energy by means of gas or water drives has increased recoveries greatly in many fields. The general success of secondary recovery methods shows that the apparent depletion of oil pools has been caused more com-

Presented before the Petroleum Divisions of the American Institute of Mining and Metallurgical Engineers at Oklahoma City on October 7, 1937.

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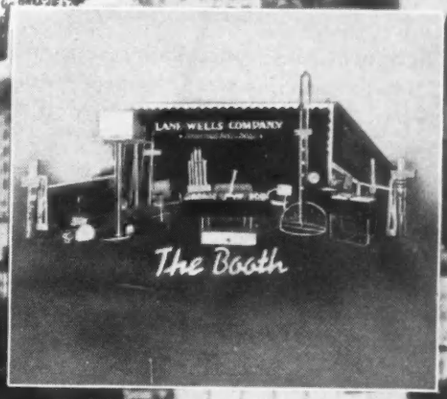

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monly by exhaustion of the reservoir energy than by removal of all of the recoverable oil. It appears that the problem of maximum natural recovery of oil is largely a problem of maximum efficiency in the utilization of reservoir energy. This consideration suggests that the spacing problem is closely related to the problem of reservoir energy. Knowlton[22] said: "The use of reservoir energy is in effect a substitute for the drilling of wells, and the more it is conserved the fewer wells are necessary.

Many approaches to the well-spacing problem have been made from the viewpoint of draining all of the sand. If a reservoir contains enough energy to move 25 percent of its oil into the wells, it is immaterial whether 25 percent of the oil is removed from every unit of the reservoir or of any given lease, or whether 50 percent of the oil is removed from half of it. The important thing is to get the greatest possible benefit from the reservoir energy.

Reservoir Energy

There are three sources of reservoir energy:

1. The most important source of energy is the pressure of water adjacent to the oil in the porous rocks.

2. Gas under pressure is a very important source of energy in many fields. It may exist as free gas in a gas cap and as gas dissolved in the oil. The free gas in a gas cap supplies energy proportional to its amount and also proportional to its pressure, which in turn is usually determined by the pressure of adjacent water. Dissolved gas may come out of solution on reduction of reservoir pressure, forming gas bubbles throughout the porous reservoir, and furnishing a source of energy for moving recoverable oil. Some of the gas released from solution may go into the gas cap.

3. In reservoirs lacking pressure from water or gas, gravitation may cause pressure gradients in the oil itself and may cause a slow seepage of oil into wells or mine workings. Gravitation might be considered the primary source of reservoir energy, since it causes the pressure in fluids in artesian basins.

The pressure found in oil reservoirs usually approximates the normal pressure of an artesian basin of the same depth. Lenticular or shoestring sands, and other isolated porous zones may contain fluids under abnormally low pressures, and are rather common. Pressures conspicuously higher than the normal artesian pressure for the given depth appear to be rare except on the Gulf Coast. It has been suggested that they may be caused by seepage of high-pressure gas from deeper horizons.

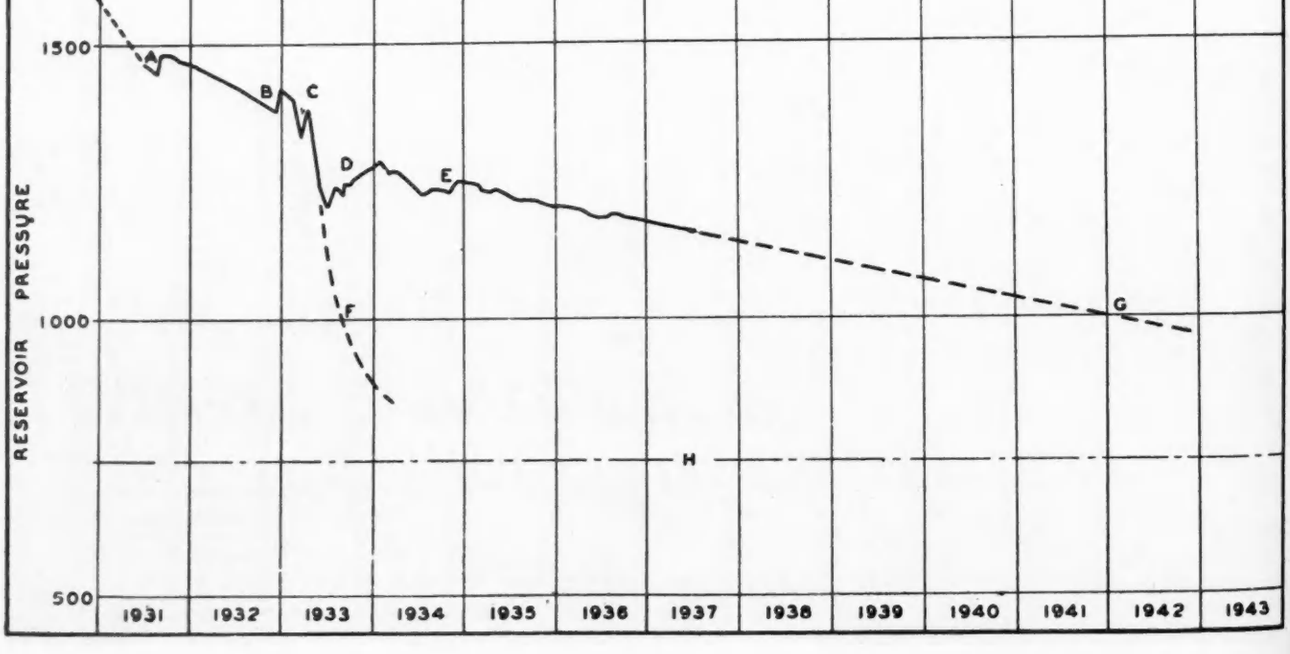
The first two sources of energy mentioned are of greatest importance in oil production. They may be recognized and their relative effects may be evaluated rather accurately by the use of reservoir-pressure data; particularly the rate of pressure decline per unit of oil produced at different rates of flow, and the behavior of the reservoir pressure when the field is shut in or severely restricted.

A field under water drive will have normal reservoir pressure when it is first tapped, and the pressure tends to decline when the fluids are set in motion.

FIGURE 1

Reservoir-pressure history of the East Texas field

Data after W. S. Morris: General Conditions in the East Texas field. OIL WEEKLY (1937) 85, No. 12, 38. A, B, C, pressure increases caused by shutting in the field. D, E, pressure increases caused by restriction of field outlet. F, G, pressure at which artificial lift is usually necessary. H, pressure at which gas begins to come out of solution.



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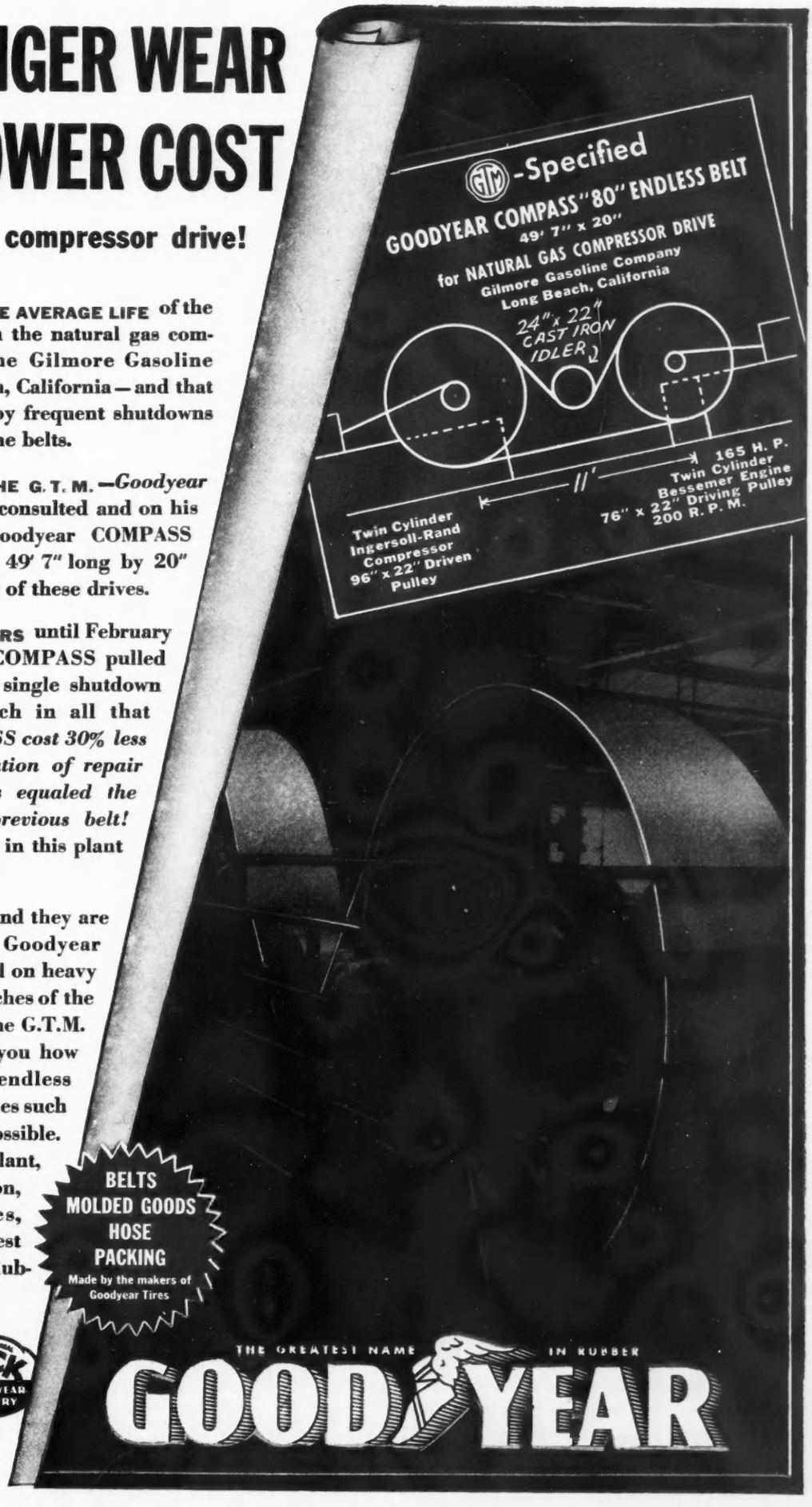

The depleted pressure of a reservoir under water drive may be built up if the field is shut in or severely restricted. It is by this characteristic that the activity of water drive may be indicated. This is illustrated in Figure 1, which shows the reservoir-pressure history of the East Texas field. The increases in pressure at A, B and C were caused when the field was shut in by government orders. The increases at D and E were caused when the field outlet was restricted. By producing any water-drive field at different rates of flow, a rate of volumetric withdrawal may be established at which the reservoir pressure remains approximately static, and so the effectiveness of the water drive may be evaluated in terms of units of water encroachment per day. Water drive balances production in the following fields at the approximate rates given:

Yates field, Texas	45,000 bbl. per day.[14]
Hobbs field, New Mexico	33,000 bbl. per day.[28]
East Texas field, Texas	400,000 bbl. per day.[14 15]

Fields under gas drive tend to have the same rate of pressure decline per unit of oil produced for all rates of flow, if the gas-oil ratio remains constant. The rate of pressure decline per unit of oil produced will respond quickly to variations in the gas-oil ratio. In a field under gas drive only, the depleted pressure will remain static when the field is shut in. Discussions of the mechanics of a pure gas drive have been given by Herold,[25] and by Coleman, Wilde and Moore.[26]

A single field may be subject to water drive, and at the same time have a free gas cap. Such a field may show characteristics of both drives. At rates of withdrawal less than the rate of water drive, the field will show the characteristics of a water-drive field. The characteristics of gas drive will predominate at higher rates of withdrawal, and may mask the effect of water drive. This is illustrated by the Yates field, which shows the characteristics of a gas-drive field at rates of production more than 45,000 barrels per day, and water-drive characteristics when producing less than 45,000 barrels per day. It must be remembered that the volumetric withdrawal is the critical figure, and that any material change in gas-oil ratios or in water production will affect the critical rate of oil production for a given water drive.

It is often stated that certain fields have no water drive. Attention is called to the critical production rates of the previously mentioned fields as expressed in terms of barrels per acre per day. These critical rates at which water drive balances production are, approximately:

Yates field	2.25 bbl. per acre per day
East Texas field	3 bbl. per acre per day
Hobbs field	5 bbl. per acre per day

Water drive should not be considered lacking until the reservoir-pressure performance has been studied with the field shut in, or restricted to rates of production as low as 1 or 2 barrels per acre per day.

Utilization of Reservoir Energy

Energy of water drive may be utilized efficiently by producing the oil at rates not exceeding, or exceeding only slightly, the rate of effective water drive. Enough wells should be drilled to permit this withdrawal without creation of local low-pressure areas. The volume of water produced with the oil should be restricted as much as possible, as the water produced contributes to the pressure decline. Water produced with the oil may be returned to the producing sand in edge wells or in dry holes. This is a conservation measure, as it helps to maintain the reservoir energy that moves the oil.

The efficient utilization of water-drive energy, and the advantages thereof, are well illustrated in the East Texas field. As mentioned above, it has been shown that the effectiveness of the water drive is about 400,000 barrels per day, and that about 450,000 barrels per day may be produced with a reasonable pressure decline. During May and June, 1933, the field was produced at rates as high as 1,000,000 barrels per day and the reservoir-pressure decline was as high as 5 pounds per square inch per day. The outlet of the field was then reduced gradually to about 450,000 barrels per day and the pressure increased for several months as shown at D on the graph. Had the high rate of pressure decline continued until August, 1933, the average pressure of the field would have been down to 1000 pounds per square inch, the pressure at which artificial lift usually becomes necessary. The total production to that time would have been about 460,000,000 barrels. The average reservoir pressure now (August, 1937) is about 1140 pounds per square inch owing to the more efficient rates of withdrawal prevailing during the past four years, and the field has produced nearly 1,100,000,000 barrels of oil. The average pressure of the field will, if present operating conditions continue, decline to 1000 pounds per square inch some time about the end of the year 1941, by which time the field will have produced approximately 1,800,000,000 barrels of oil. The advantages of producing 1,800,000,000 barrels of oil with a decline of average pressure to 1000 pounds, as compared with producing 460,000,000 barrels with the same pressure decline, are obvious. The high rate of production prevailing in May and June, 1933, would, in a few months, have reduced the average reservoir pressure to 740 pounds gauge, the pressure at which gas begins to come out of solution, leaving dead oil in the sand.

The energy of reservoirs under gas drive may be conserved by maintaining the lowest possible gas-oil ratios. The most efficient rate of production for such fields is the rate at which the lowest gas-oil ratios may be maintained, which in turn depends on the gas-oil ratios of individual wells and on the number of wells. Cutler[5] applied his conclusions regarding spacing and recovery to fields under pure gas drive. Herold[25] and Phelps[27] suggested that the greatest recovery by gas drive would be obtained with an infinite number of wells, all beginning to produce at the same time. Most authorities, including the U. S. Bureau of Mines engineers previously cited[5, 13, 16-21], believe that interference between nearby wells will limit the general consideration of more wells, more oil in gas-drive fields. The problem must be solved by balancing desired ultimate recovery per well, current market demand, and gas-oil ratios of individual wells.

In fields in which both water drive and gas drive are present, both forms of energy should be conserved. The field outlet should be kept near the effective rate of water drive. Water production should be restricted, since it increases the volumetric withdrawal per unit of oil. Low gas-oil ratios should be maintained in order to conserve the gas pressure and to minimize volumetric withdrawal, which affects the

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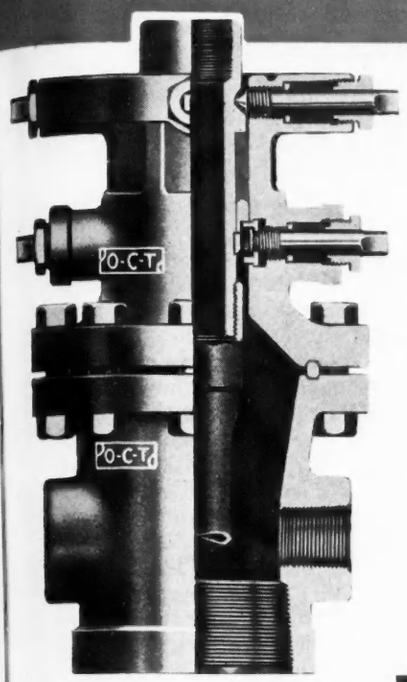
THEN SET PACKER AND WASH UP TO SUSPENSION POINT

The Types "H-6" and "H-7" retractable seat tubing heads permit washing behind liner before packer is set. The tubing head body screws on the oil string before plug is drilled, and plug is drilled through blowout preventer equipment installed on tubing head body. After drilling the plug, blowout preventer equipment is removed; a joint or two of tubing, with liner and packer installed below, is lowered in the hole. Then, the top assembly of the Christmas-tree is stripped over the tubing and connected to the main body of the tubing head.



O-C-T type "H-7" Tubing Head above, for 7" OD Casing—2" or 2½" Upset Tubing—flanged top to fit 4" flanged gate.

3000 lb. and 4000 lb. Test.....$181.28
6000 lb. Test 214.38

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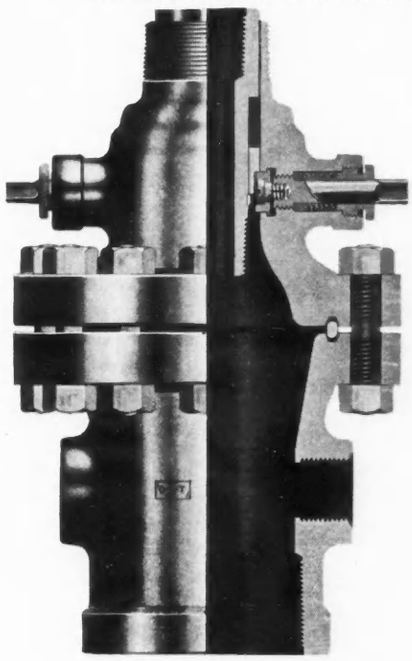

O-C-T type "H-6" Tubing Head at right, for 7" OD Casing—2" or 2½" Upset Tubing—top connection to fit 4" valve.

3000 lb. and 4000 lb. Test.....$146.28
6000 lb. Test..... 179.38

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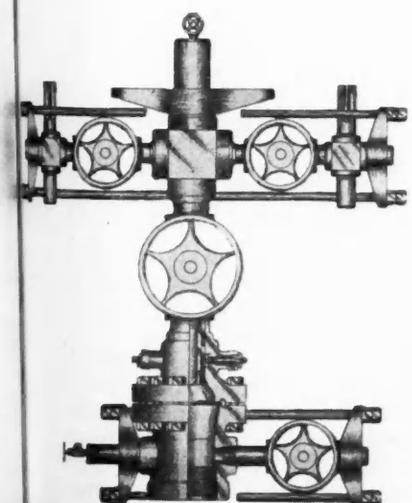
U. S. Patent No. 2086431

An O-C-T blowout preventer, equipped with a stripper rubber and installed above the tree, permits running the tubing string to bottom in perfect safety, the stripper rubber passing tubing collars and serving as a stuffing box while washing behind liner. The tubing hanger, which also passes through the stripper rubber is made up in the tubing string at the desired point. The retractable seats provided in the tubing head bonnet are screwed out to permit the hanger to pass while lowering the tubing string to wash behind the liner and collapse the packer.

After this operation, tubing is then raised to the suspending point and the retractable seats are screwed in to engage the tubing hanger. The landing joint of tubing is then backed out and raised above the master gate valve, which is then closed, and the blowout preventer is removed. A bull plug and pressure gauge are then installed.

No flush joint tubing is needed. This hook-up permits the running or pulling of tubing through valve on top of tubing head at any time before or after the well has been brought in.



ove one of several O-C-T assemblies washing behind liner. Assembly ere with "H-6" Tubing Head to fit 7" Casing, 2½" Upset Tubing; 2" casing ves; 4" master control valve; and 2" ing flow lines, assembled and tested 000 lb.....$751.91

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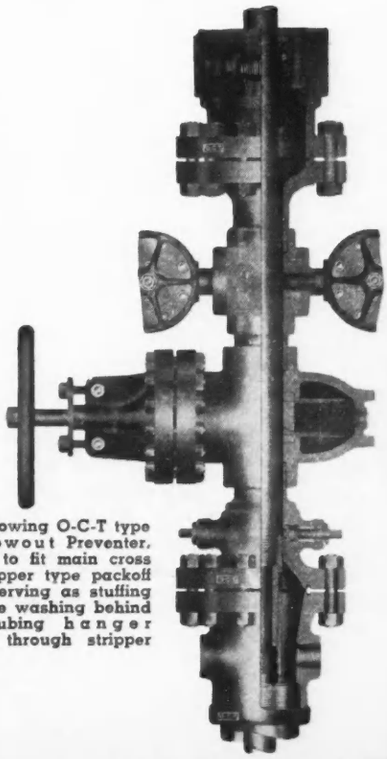

Right, showing O-C-T type "H" Blowout Preventer, adapted to fit main cross with stripper type packoff rubber serving as stuffing box while washing behind liner. Tubing hanger passes through stripper rubber.

O-C-T type "H-6" Tubing Head assembled and tested in 4000 lb. test Christmas tree. Benavides, Texas, field.

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effectiveness of the water drive in terms of daily production.

Gas Drive Recovery Versus Water Drive Recovery

The mathematical theory of gas drive indicates that an infinite number of wells, all starting to produce simultaneously, would be needed to recover all of the recoverable oil.[25, 27] It is impossible to drill an infinite number of wells. If an acre of reservoir contained 100,000 barrels of recoverable oil and 1000 wells were drilled on this acre, which is physically possible, the recovery per well would be only 100 barrels. Spacing in a gas-drive field must be sufficiently wide to allow each well to produce enough oil to return a profit to the operator.

Theoretically, one well properly placed in a reservoir under water drive would recover all the recoverable oil if given enough time. The time required for one well to drain the reservoir might be impractically long, and as in the East Texas field, for example, it might be physically impossible to produce daily from one well the amount of oil the reservoir is capable of producing without pressure decline. It may be necessary to drill a number of wells to utilize the water drive fully each day.

Theoretical analyses of the recovery problem are based on homogeneous reservoirs. Actually the permeability of reservoir rocks is variable. By-passing takes place in either type of drive, leaving movable oil unrecovered in the tighter portions of the reservoir. Recoveries actually attained in oil fields operated under natural gas drive appear to be of the order of 20 to 25 percent of the total oil in the reservoir. Recoveries under water drive may reach 50 percent or more.

Water drive requires a smaller number of wells than gas drive to attain a given recovery. Water drive will give a greater ultimate recovery than gas drive for any well spacing that is economically practicable.

Many fields are subject to combination drives, and a pure water drive may be changed to combination drive by excessive rates of withdrawal, which reduce the reservoir pressure and bring gas out of solution. It is optional with the operators of such fields to produce them by gas drive or by water drive. The oil may be produced at a rate considerably in excess of the effective water drive. This results in rapid pressure decline, short flowing life, gas released from solution and dead oil left in the sand. On the other hand, the field may be produced at a rate equal to the effective water drive with little or no reservoir-pressure decline, long flowing life, gas retained in solution with the water drive working against live oil, and, most important, greater ultimate recovery. Operating combination fields under water drive will give more stable current supply of oil.

It must be emphasized again that water drive should not be considered lacking until the field has been tested at rates of flow as low as 1 or 2 barrels per acre per day. It must be admitted that wells 6000 feet deep, on 10-acre spacing, cannot be operated profitably at 2 or 3 barrels per acre per day. Wells on 40-acre or wider spacing could be operated on such daily per acre allowances, ultimate recoveries would be higher than with closer spacings under gas drive, and a large part of the oil would be produced by natural flow. If water drive is absent, or effective only at impractically low rates, the field can be drilled to a greater density for gas drive.

To summarize: Reservoir energy may be utilized efficiently by operating oil fields in such a way as to maintain minimum gas-oil ratios, to produce a minimum amount of water, to maintain a slow pressure decline and to avoid the formation of low-pressure areas. The field should be operated as a water-drive field if water drive is present.

Solution of the Spacing Problem

The following procedure is suggested to solve the spacing problem in a new field. After discovery, the field might be outlined by exploratory wells on a rather wide spacing pattern. The field could then be studied at varying rates of production to determine the nature of the reservoir energy and the effectiveness of the water drive. The rate of production that utilizes reservoir energy most efficiently could be determined. During this time, considerable data on the performance of individual wells would accumulate. Development could then be planned to drill such a number of wells that each well might operate at its own most efficient rate, and the total of the production of all of the wells in the field equal the rate at which the field itself would utilize its reservoir energy most efficiently. This procedure would yield the maximum natural recovery with the minimum development cost consistent with efficiency.

The above solution may be applied to the East Texas field as an example. Suppose that the average well in this field can produce 100 barrels per day without local physical waste. The field is now producing about 450,000 barrels per day with a reasonably low rate of pressure decline. Then 4500 wells, each producing 100 barrels per day, could produce the field's allowable production. This would correspond to a spacing of about one well to 30 acres. The East Texas field had a proration allowance of 225 barrels per well per day in September, 1931, and no particular evidence of local waste in individual wells was noted. On this basis, 2000 wells, each producing 225 barrels per day, might be sufficient to utilize the reservoir energy efficiently. This would correspond to a spacing of one well to 62½ acres, or about 1600 feet between wells. At first thought, it might appear doubtful that one well would drain 62½ acres, but such a spacing would not be unreasonable in such a highly permeable sand as is found in East Texas. Christie[28] has cited cases in which heavy production from one well has caused pressure decline in wells 2000 to 3000 feet away. The high permeability of the sand and the lack of evidence of local waste at 225 barrels per well outlet make it appear reasonable that 2000 wells, each producing 225 barrels per day, would utilize reservoir energy as efficiently and recover as much oil as 22,500 wells each producing 20 barrels per day. It appears that there may be 20,000 unnecessary wells in the East Texas field.

The procedure suggested above could be applied easily in fields under one ownership, or in fields that can be unitized. In many fields, there are tracts that are smaller than a normal drilling location. It might be possible to unitize small tracts into drilling sites without necessarily unitizing the field. If efforts to unitize fail, and if small tracts are drilled with close spacing, a proper acreage factor in proration will prevent unequal drainage, and will relieve surrounding operators of the necessity of close drilling to protect their royalty owners. It then becomes optional with the operators to choose close spacing with small per well allowable production, or wider spacing with larger per well allowable production.

Lewis[29] has shown that safety is in the direction of

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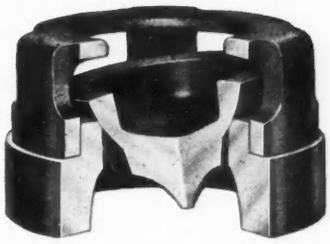

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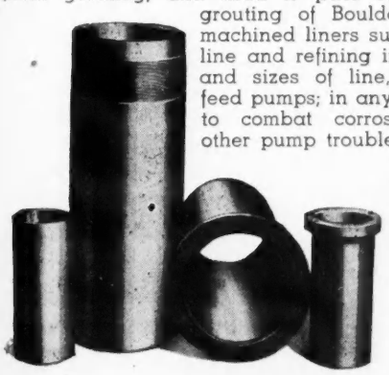

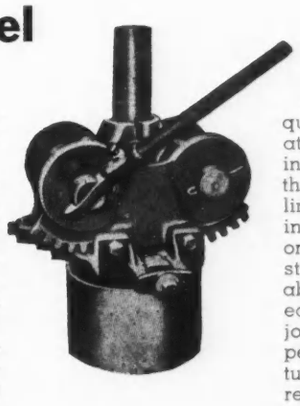

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wider spacing. Too wide spacing can be cured by additional drilling or by repressuring. The money lost through unnecessary drilling cannot be recovered.

There are reservoirs containing small, disconnected zones of rich productions; fields in which production is found in fractures, fields of very erratic porosity and fields badly faulted are examples of this class. The principles applied to more uniform pools may not apply in such fields, and it may be necessary to drill more closely as a sporting proposition in order to be sure that all the rich zones are tapped. The answer to this problem is to learn to drill more cheaply.

Conclusion

It appears that the ultimate recovery of many fields has been determined by the degree of efficiency of utilization of reservoir energy. The utilization of reservoir energy should be considered to be of primary importance, and the well-spacing pattern should be designed to give the most efficient use of the energy in the reservoir.

Each field should be tested carefully for water drive, and it should be utilized if present. Water drive permits wide spacing with low development costs, long flowing life with low lifting costs, and the maximum natural ultimate recovery.

The proper solution of the well-spacing problem for water-drive fields is to divide the efficient rate of production of the field by the efficient rate of the average individual well. The quotient is the number of wells that should be drilled. The solution for gas-drive field is found by striking a balance between gas-oil ratios of individual wells, current market demand for the oil, and the desired ultimate per well recovery.

Acknowledgements

The writer has discussed the problems involved in this paper with a number of engineers and geologists and is greatly indebted to all of them. Especial acknowledgements are due to the Messrs. M. Albertson, F. A. Bush, K. A. Covell, J. T. Hayward, T. V. Moore and H. H. Power.

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Chemicals are injected at the well head by small pumps operating off the walking beam. The small rectangular supply tank may be seen in the right background with the copper tube leading to the flow line.

PROGRESS MADE IN

Treating Talco Crude

By BRAD MILLS, Associate Editor

THE oil treating problem in the Talco, Texas, field has been simplified by a combination of mechanical, chemical and electrical adaptations that meet exacting requirements for a heavy and viscous crude. The low gravity of the oil and close association with water offered a serious barrier to operations during the early life of the field. The emulsions were difficult to break up, and full separation of the oil and water did not follow the treatment that had proved effective in other fields.

Much Experimentation

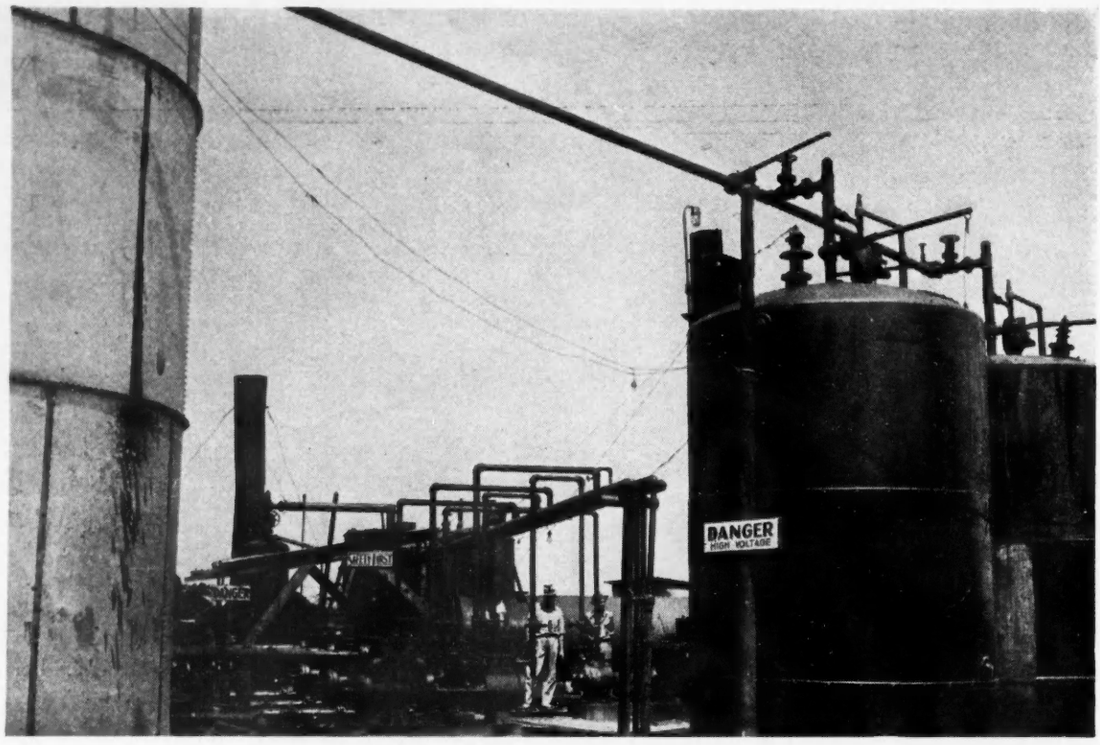
Operators attacked the treating problem through various chemical, mechanical and electrical combinations. Progress came gradually along several lines, and at the end of the first year satisfactory treating methods had been developed.

One Talco operator used more than 600 chemical combinations before adopting one suited to his needs. Other operators experimented only long enough to find a formula that would meet nominal requirements for pipe line oil. A few small companies refused to worry with treating problems, and avoided the issue by turning over their production to a pipe line company operating a central treating plant in connection with an elaborate gathering sytem.

In attacking the treating problem at Talco, many interesting facts were established. Chemicals used effectively in other fields failed to give uniform results, and because of this early difficulty operators feared an expensive treating problem. Chemical companies and manufacturers of treating equipment cooperated in the program that reduced both hazards and costs. One large operator continued its research work, and recently established a new low record for treating costs. A smaller company changed its treating method and reduced the cost by almost half. Most of the larger operators are still receptive to changes that will give lower treating costs or a less complicated layout.

Several Combinations Effective

Several mechanical combinations have proved effective, but the application of heat depends on weather conditions and the type of oil treated. Oil produced on the west side of the field averages about 21.5 gravity, while that produced on the east side is a 20-gravity product. The two crudes must be treated in a different man-



A central treating plant for handling Talco crude on a commercial scale. Electrical dehydrators are used.

ner because of a peculiar variation in water and emulsions. The use of chemicals is a necessity in every type of treating, and ahead of all mechanical, electrical and heat applications the chemical best suited to the need is introduced. The crude after chemical treatment is simply handled in a manner that will give full separation of oil and water before it reaches the gauge tank. This flow has been shortened and simplified by several operators who have developed their own methods. Patented treaters also are widely used.

One of the largest operators uses a "hay" tank to advantage, the arrangement being an adaptation of an idea developed some time ago. This tank is the gun barrel type that is equipped with a series of conical baffles. The principle of operation is simple but effective. Crude from the well enters the bottom of the tank under enough pressure to force the flow out the top. The space between each baffle is packed with excelsior, or wood hay, hence the name "hay" tanks. The first baffle removes most of the water. The next two baffles trap the remaining water. Heat is used under certain conditions, but where an effective chemical has been used and weather conditions are favorable little heat is required.

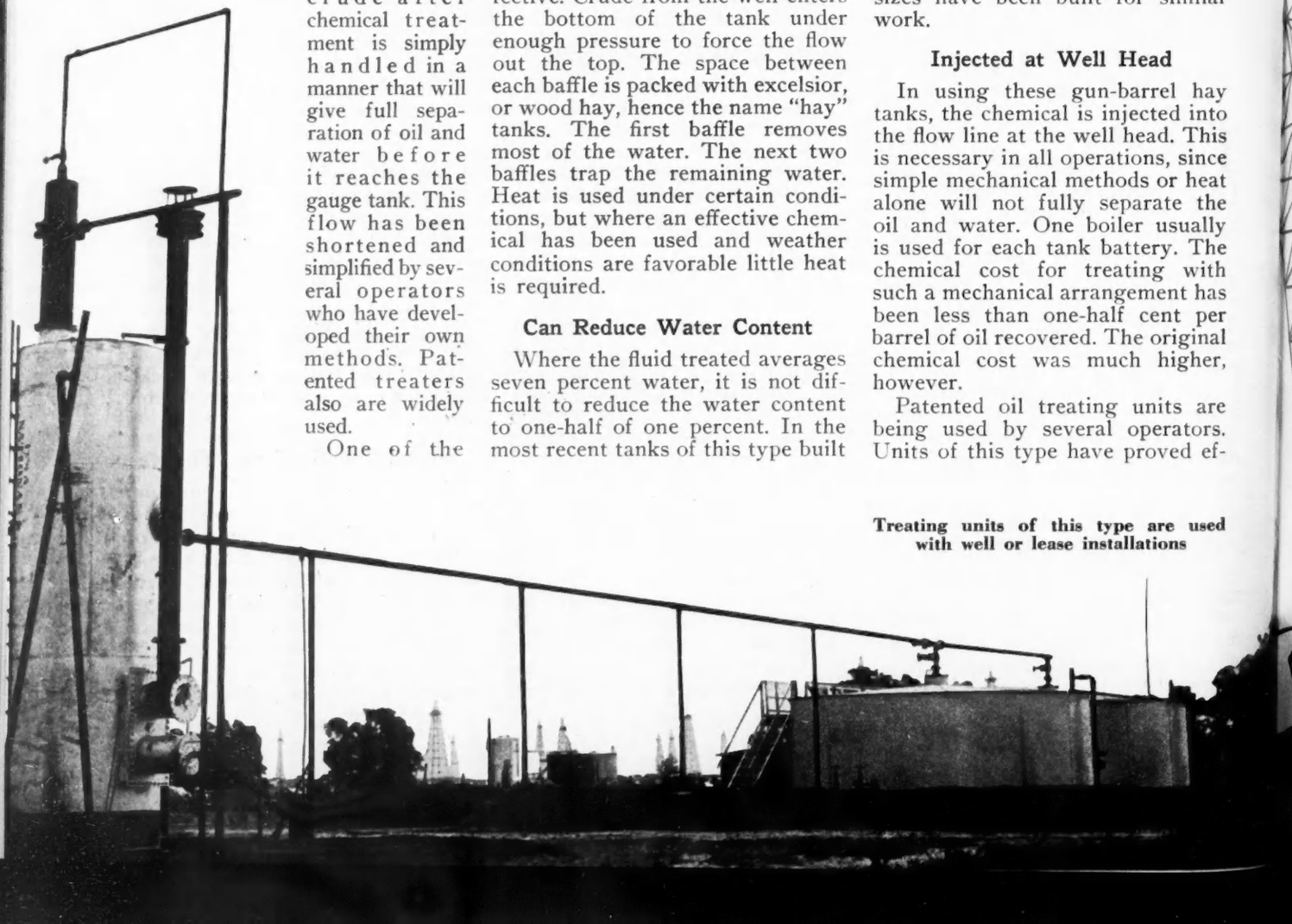
Can Reduce Water Content

Where the fluid treated averages seven percent water, it is not difficult to reduce the water content to one-half of one percent. In the most recent tanks of this type built by the company, it has been possible to reduce the water content of the fluid from 17 percent to less than one-half of one percent. These tanks are the gun barrel type, with one bleed-off at the bottom and a capacity of 1500 barrels. Smaller sizes have been built for similar work.

Injected at Well Head

In using these gun-barrel hay tanks, the chemical is injected into the flow line at the well head. This is necessary in all operations, since simple mechanical methods or heat alone will not fully separate the oil and water. One boiler usually is used for each tank battery. The chemical cost for treating with such a mechanical arrangement has been less than one-half cent per barrel of oil recovered. The original chemical cost was much higher, however.

Patented oil treating units are being used by several operators. Units of this type have proved ef-



Treating units of this type are used with well or lease installations

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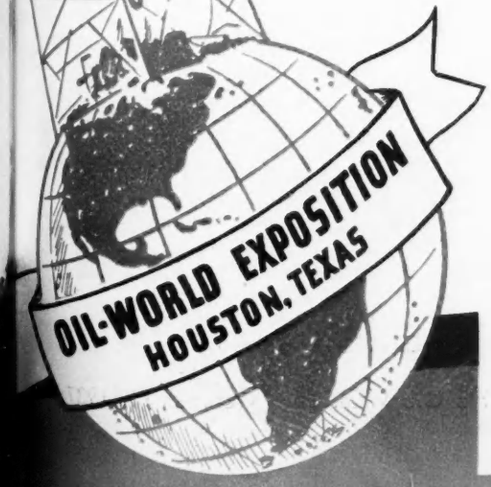

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ficient in the recovery of oil from emulsions, and where continuous automatic operation has been desirable. Most of these vertical treating units are equipped with integral heaters, but they also function in connection with the use of chemicals. The chemicals usually are injected into the flow line at the well head, and the movement of the oil regulated through the treating units to give a full separation of the oil and water. The use of treaters of this type has proved effective where true emulsions were present.

Electrical Units Effective

Electrical treating units are being used effectively, and some of the most troublesome emulsions are being handled with this type of equipment. As in the case of mechanical treating units, chemicals are used ahead of the electrical dehydrators, the quantity of chemicals depending on the nature of the crude.

Where oil from individual wells or leases is treated, chemicals are injected at the well head by small pumps operating off the walking beam. On some wells it is necessary to release the chemicals only every fourth stroke. A small copper tube carries the chemicals to the flow line from a small container under the sampson post. Many wells produce a negligible quantity of water.

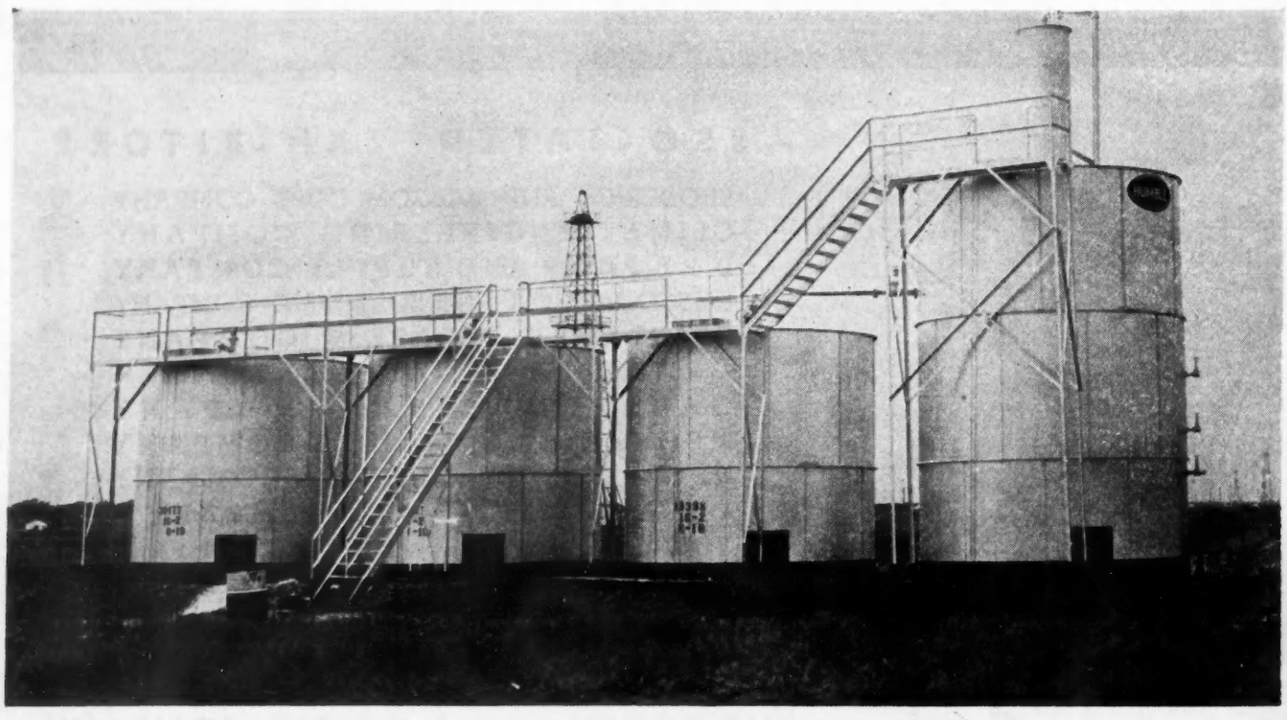
A Central Plant

A local pipe line company operates a central treating plant and handles oil for several operators on a commercial basis. This company treats from 1000 to 1800 barrels of oil daily, the water content of the incoming fluid ranging from 10 percent to 65 percent. At this treating plant all production arrives exactly as it came from the well, no effort having been made to reduce the water or b.s. content. Oil received for treatment is run to storage tanks and sampled. It is picked up by pumps and the necessary chemicals injected at this point. The flow is then through a boiler that serves chiefly as a heater. A light fire is carried in the boiler to maintain a temperature of about 180°F. The fluid is simply pumped through the boiler, the water level in the boiler rising or falling as the cut of the incoming oil varies. The oil thus heated and treated passes on under light pressure to electrical treating units. The treated oil shows a cut of less than one percent, and the average is much less for treating stock that originally showed only a reasonable amount of water and emulsions. Although this plant treats all oil offered, the oil recovered always exceeds nominal pipe line requirements. Where the incoming oil shows a cut of 10 to 12 percent, it is not difficult to reduce the cut to less than one-half of one percent. The oil in the stocks tanks is heated as much as possible to reduce the load on the treating plant. The treating of cold oil is much more difficult than hot oil.

Methods Offset Weather

Talco crude is a viscous product that is sharply affected by weather conditions. A pipe line company handling this oil could get but 172 barrels per hour through an 8-inch line at 700 pounds pressure during the winter months, but increased the flow to more than 500 barrels per hour during summer. Three booster stations were built along an 80-mile line to give a more uniform delivery during cold weather.

Handling the oil in the field is a problem during cold weather, and treating efforts are more than doubled during winter months. Where adequate heat is provided, normal treating operations can be carried on during any kind of weather.



Treating tanks of this type are in common use at Talco. The gun barrel tank at the right is a "hay" tank equipped with a series of conical baffles, the space between baffles being filled with excelsior or wood hay

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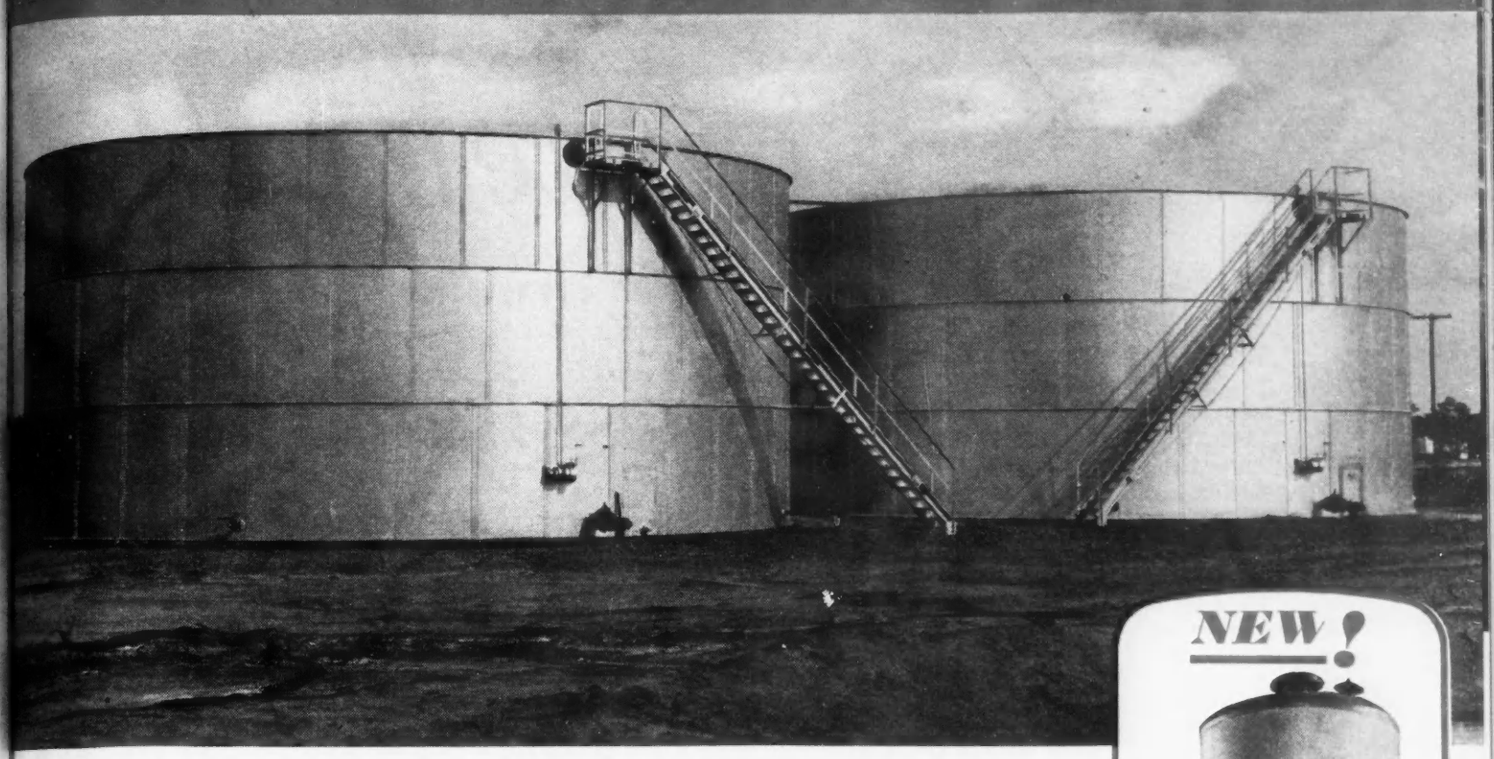

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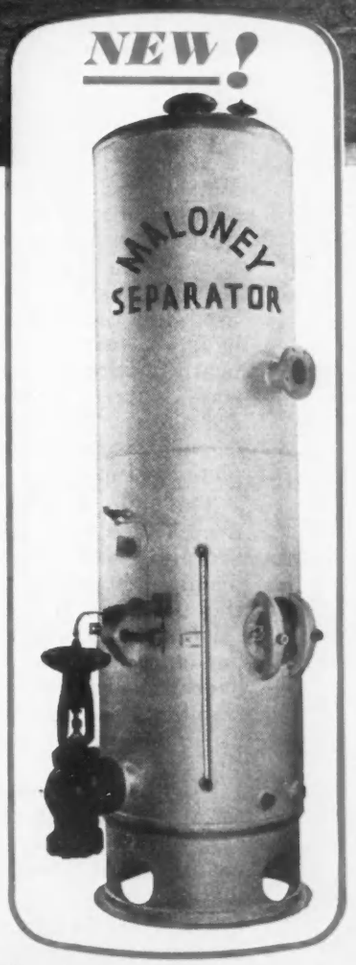

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Our exhibit will also feature the new MALONEY Oil and Gas Separator, which is the most recent addition to our line. This improved separator introduces a number of new features. For example, its Mist Traps separate all of the oil from the gas vapors and allow only the dry gas to escape through vent in top of separator. All elements of mist extraction are patented. Another feature is the increased capacity of the initial chamber where oil and gas enter separator. This chamber provides a higher vertical travel for vapors or gases as they enter the new Knock Out Element. The MALONEY Separator is offered in standard sizes and working pressures and is constructed to comply with A.P.I. and A.S.M.E. standards.

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KEYSTONE AMERICAN

MALONEY TANK MFG. COMPANY

38 N. PEORIA **TULSA, OKLA.**

MALONEY

MALONEY PATENTED BOLTED COPPER-STEEL TANKS

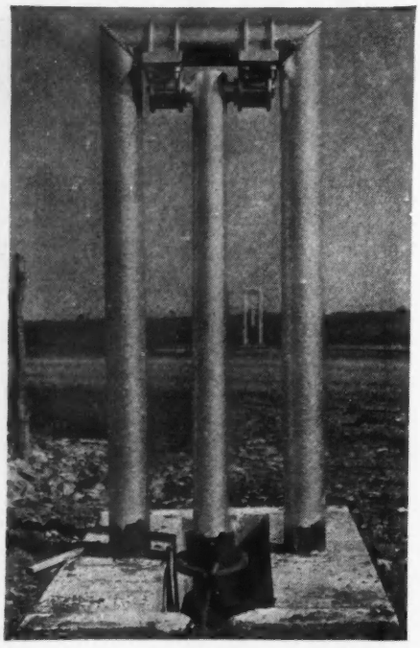


FIGURE 1
Detail of construction of highway underpull as installed by The Texas Company. In the distance, across the highway, is the standard powering the well.

Highway Underpull

COMBINES

Neatness With Utility

By FRANK B. TAYLOR, Staff Writer

A HOLD-DOWN recently installed by The Texas Company in a pull rod system to shallow production in Tulsa County, Oklahoma, is a novel departure from regular construction. Pipe has been used for the standards, the dual hangers transmitting power beneath a recently cut major highway. Concrete bases for each standard assure rigidity and add to the cleancut appearance of the completed setup.

The pipe standards are welded from 7-inch pipe, the return being through two 90 degree angles. The distance between the centers of the uprights is about 29 inches, this exact measurement being dependent upon the spread of the overhead hanger. Legs of the standards are set in concrete. Two "U" bolt pipe hangers serve as supports to the swinging driver. Each of these hangers is sleeved for a three-inch shaft, which in this case is pipe welded directly to the swing, about five inches from actual top.

The total height of each swing is dependent upon the allowable pull rod drift from horizontal. As the lower end of the swing describes an arc in a completed, single motion, the movement is a function of a circle. Consequently, the longer the radius, or the distance from the bearing of the swing to the power take-off, the more nearly a straight line will be the motion of the attached pull rods.

In the installation made by The Texas Company, the standard nearest the power (Figure 1) is seven feet in height, made of 5½-inch OD pipe. The standard nearest the well is 9½ feet in height.

The concrete boxes into which the standards have been set measure four feet across overall, by about nine feet in length. This, again depends upon the full pull of the power through the action of the lower end of the swing. From the top of the concrete box to the bottom it is three feet, four inches. The width of the interior opening measures 16½ inches. This makes the side walls of the form 15½ inches in thickness, and the two ends 6½ inches in thickness. Pull rods are connected by fixed clamps to a return hook working beneath a bar. A six-inch pipe acts as guide for the connecting pull rod beneath the highway, each end being even with the inside of the concrete boxes.

As installed, the equipment is attractive, painted top and bottom, and is silent in operation. There is no objectionable play in the moving parts.

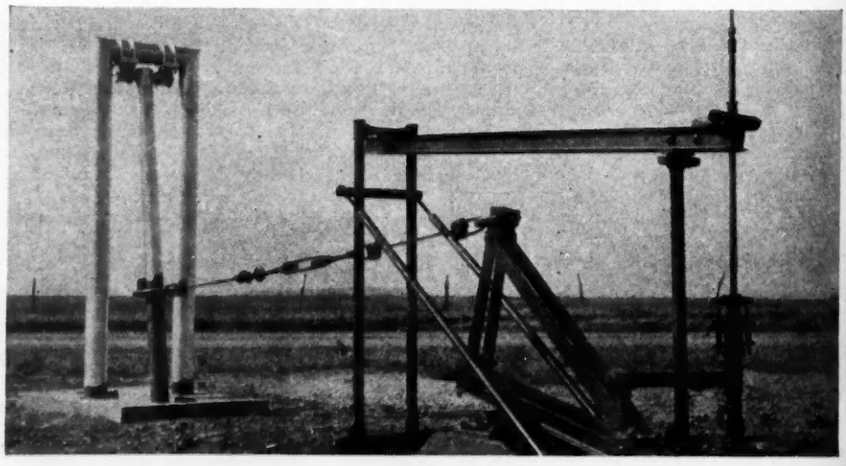
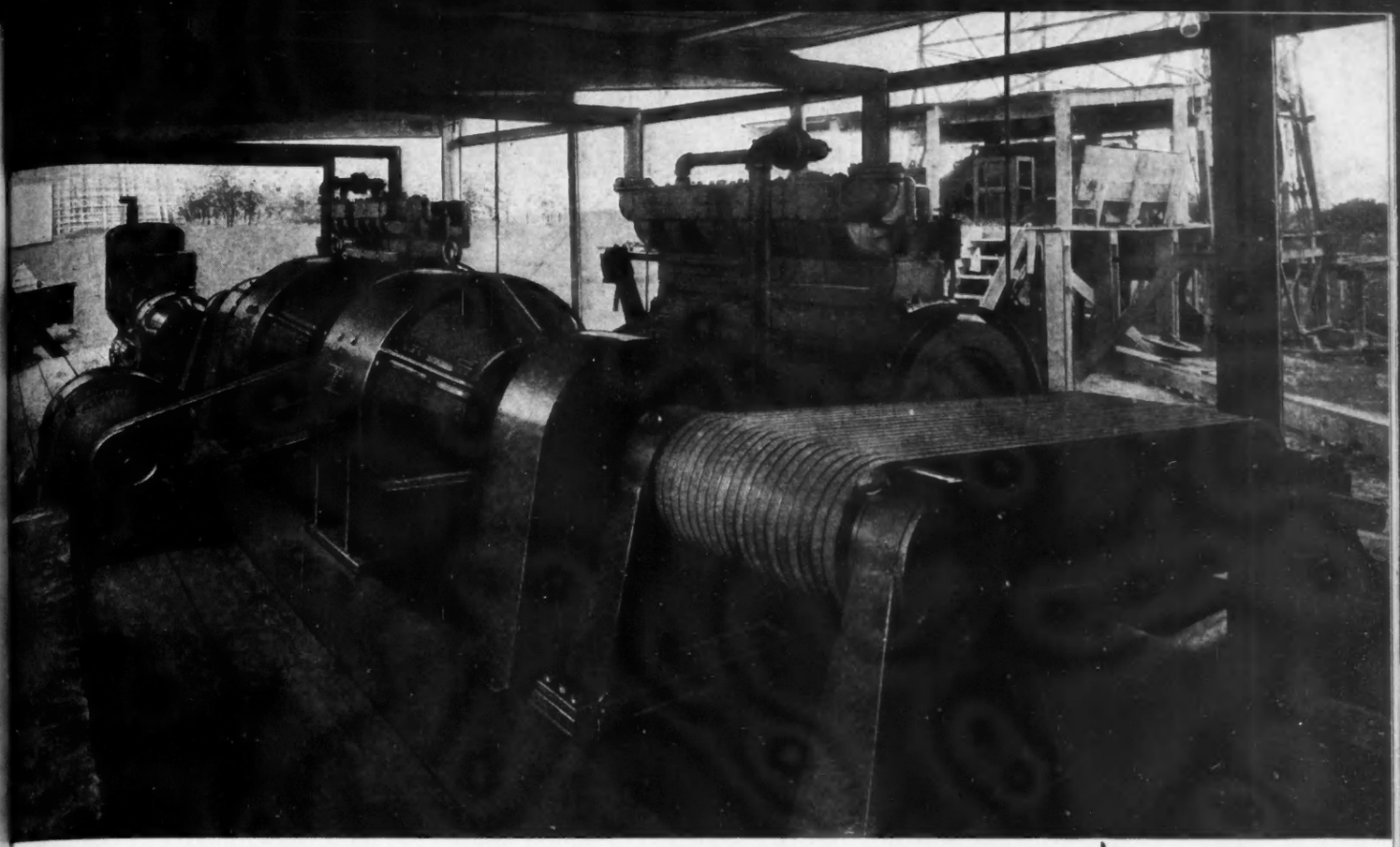
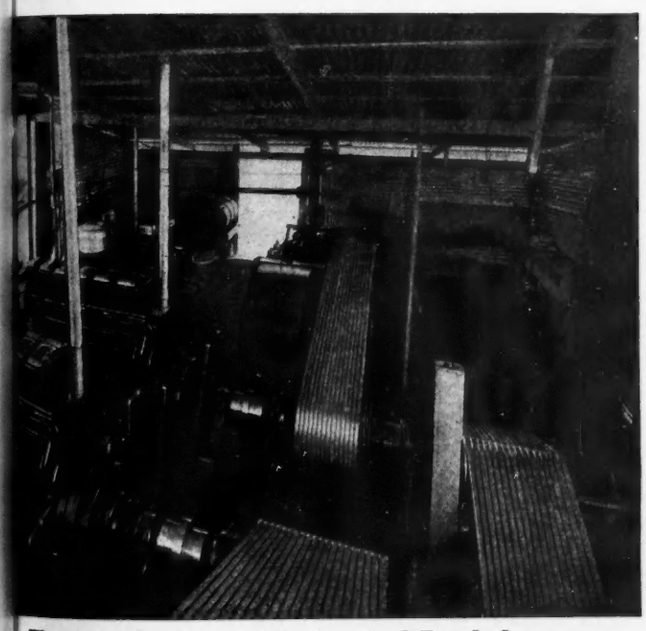


FIGURE 2
Standard powering well, as being used by The Texas Company in the shallow producing area of Tulsa County, Oklahoma. Well is their E. Buckmaster 3, sec. 17-20-13e, producing from Bartlesville sand at near 1130 feet.



WE FURNISH ALL 3



Electric Rig above—Mechanical Rig below

THE *All-Electric Rig* . . . the *Electrical-Mechanical Rig* . . . or the *Texrope Driven Mechanical Rig* . . . each has its adherents, each works best in some fields. You must have the right rig for your field. Allis-Chalmers, the pioneer in d-c electric drilling, is the only company building all three and can give you an unbiased recommendation as to the proper rig.

An Allis-Chalmers rig drilled the deepest hole in Oklahoma, over 11,000 feet. Others have been sold to drill the deepest holes yet contemplated in the Gulf Coast area.

See your supply company and specify Allis-Chalmers.

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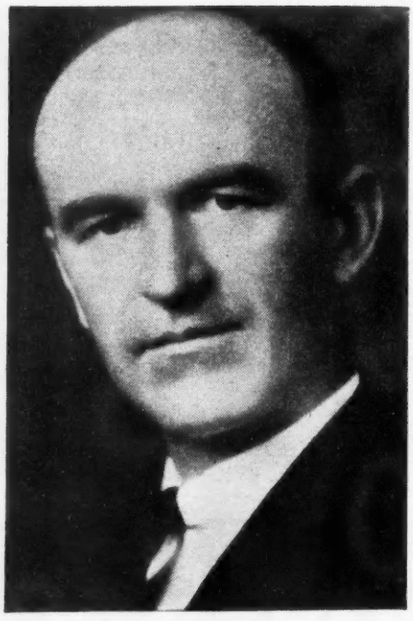
MILWAUKEE WISCONSIN

Officers and Executive Committeemen

OIL-WORLD EXPOSITION

JOHN R. SUMAN
President, Oil-World Exposition
Vice-President, Humble Oil & Refining Company, Houston



CHASE SUTTON
Executive Vice-President, Oil-World Exposition
Division Manager, Pure Oil Company, Houston

W. L. CHILDS
Vice-President, Oil-World Exposition
Vice-President, Reed Roller Bit Company, Houston

J. S. ABERCROMBIE
Vice-President, Oil-World Exposition
President, J. S. Abercrombie Company, Houston

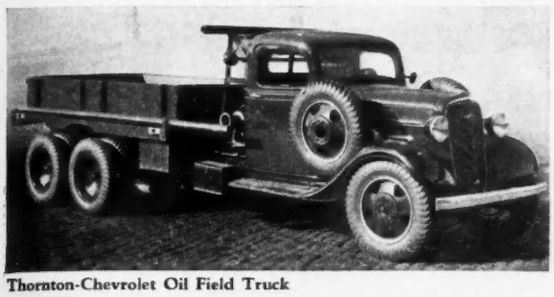
GEORGE A. HILL, JR.
Vice-President, Oil-World Exposition
President, Houston Oil Company, Houston

WALLACE D. WILSON
Vice-President, Oil-World Exposition
President, Wilson Supply Company, Houston

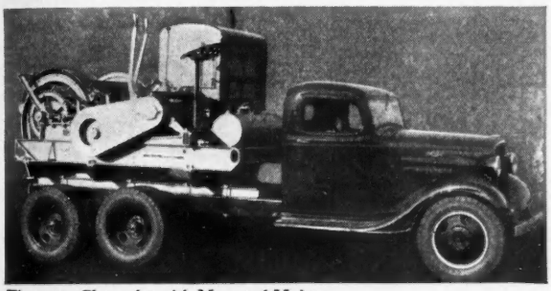
THORNTON CONVERTS LIGHT TRUCK CHASSIS INTO

BIG BRUTES

Six of a Large Fleet of Thornton-Fords Operating for Standard Oil in South America



Thornton-Chevrolet Oil Field Truck



Thornton-Chevrolet with Mounted Hoist

. . . FOR THE OIL FIELDS

HAUL LOADS 4 to 8 times heavier—easier, faster, cheaper!

That, in a nutshell, is the promise Thornton makes to oil field operators—a promise that is being fulfilled day in and day out—for every conceivable type of service, both on the highways leading to fields and in rough going off the road.

If your single axle drive trucks can't take punishment, then turn to Thornton.

Take any light truck chassis (of your own choice)—then a simple and relatively inexpensive operation by Thornton—and you have a BIG BRUTE that outperforms much costlier equipment—lowers cost of operation, actually pays dividends through extra trips and extra tons of cargo.

Somewhere near you is an operator of oil field units which are Thornton-equipped. Let's go and see him. Let's watch his equipment at work. It will change your ideas of the cost of power, load capacities and speeds.

Thornton users are boosters for these big brutes. You'll be, too.

THORNTON TANDEM COMPANY—DETROIT—MICH.

DISTRIBUTORS: BULL-STEWART EQUIPMENT CO., HOUSTON—DALLAS—SHREVEPORT
AMERICAN BODY & TRAILER COMPANY, OKLAHOMA CITY

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Thornton-Ford with Pole Trailer for Pipe Line Work (Standard Oil of Kansas)

THORNTON

FOUR REAR WHEEL DRIVE

Officers and Executive Committeemen

OIL-WORLD EXPOSITION

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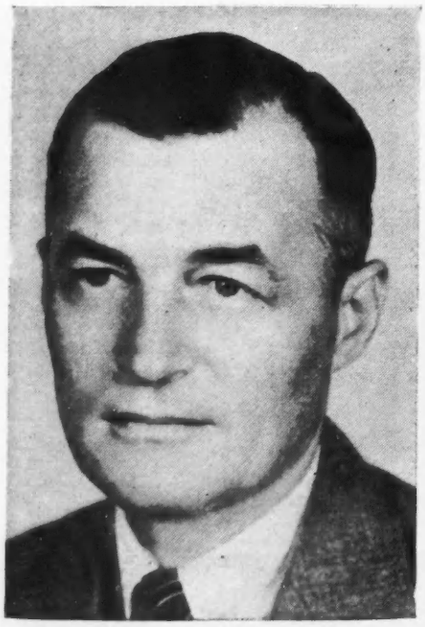
Secretary-Treasurer, Oil-World Exposition
President, Gulf Publishing Company, Houston

ED LENZNER
General Manager, Oil-World Exposition, Inc.
Houston

FRANK S. CAROTHERS
Executive Committee, Oil-World Exposition
Houston Branch Manager, Norvell-Wilder Supply Company, Houston



S. P. BROWN
Executive Committee, Oil-World Exposition
Vice-President, Hughes Tool Company, Houston

JOE H. RUSSELL
Executive Committee, Oil-World Exposition
Assistant Vice-President, Gulf Oil Corporation, Houston

W. B. SHARP
Executive Committee, Oil-World Exposition
President, Mission Manufacturing Company, Houston

HOUSTON'S DOWN TOWN DISTRICT

Showing the Oil-World Exposition Grounds and principal hotels

INDEX TO HOTELS

1—Brazos
2—Auditorium
3—Sam Houston
4—Rice
5—William Penn
6—Ben Milam
7—Milby
8—Bristol
9—Texas State
10—Cotton
11—San Jacinto
12—Lamar Annex
13—Lamar Hotel

PROGRAM during week of OIL-WORLD EXPOSITION

MONDAY, OCTOBER 11

1:30 P.M.—COLISEUM

Official Opening Program—With the following participating:
President—Oil-World Exposition—John R. Suman
Executive Committee—Oil-World Exposition
City Officials—Mayor R. H. Fonville
Governor of Texas—James V. Allred
Chairman R. F. C.—Jesse H. Jones
Vice President, John Nance Garner

1:30 P.M. to 11 P.M.—COLISEUM

Technical Films of Various Leading Manufacturers of Equipment.

U. S. Bureau of Mines Motion Pictures:

3-reel film entitled "Through Oil Fields of Mexico."
4-reel film entitled "Refining the Crude," showing complete details of refining of crude oil.
4-reel film entitled "Petroleum, the Liquid Mineral," showing cable and rotary tool operations, method of production and manufacture of natural gasoline.

7:00 P.M.—COLISEUM

U. S. Army Band, 69th Coast Artillery, Fort Crockett.

U. S. Army Aviation Division Searchlight Display and Sound Detector Maneuvers—Presented by 69th Coast Artillery, Fort Crockett.

TUESDAY, OCTOBER 12

Refinery Program—Presented by Refinery Committee:
W. H. Curtin, Chairman, W. H. Curtin & Co.
Ed G. Lenzner, Assistant Chairman; General Manager, Oil-World Exposition.
O. E. Berg, Babcock & Wilcox Tube Co.
M. N. Dannenbaum, M. N. Dannenbaum Co.
R. L. Mallory, Brown Instrument Co.
Joe Miller, Humble Oil & Refining Co.
Joe Peddie, Maintenance Engineering Corp.
George Reid, Editor, The Refiner.

Conference on Refinery Laboratory Procedures—Arranged by Chemists Division Sub-Committee:
R. H. Clough, Sub-Chairman, W. H. Curtin & Co.
Dr. F. W. Jessen, Humble Oil & Refining Co.
Fred W. Karl, Gulf Oil Corp.
R. C. Rich, Shell Petroleum Corp.
A. R. Rickards, Sinclair Refining Co.
E. W. Gardner, The Texas Co.
W. F. Fulton, United Gas Co.

9.00 A.M.—COLISEUM

"Salt Removal from Crude, Chemical and Physical Methods"—Dr. S. K. Talley, Shell Petroleum Corp.

"Controversial Methods of Asphalt Testing"—H. W. Slaughter, E. W. Saybolt & Co.

1:30 P.M.—COLISEUM

"Treatment of Boiler Feed Water"—H. L. McMullen, Missouri Pacific Railroad.

"Accelerated Method of Determining Stability of Cracked Fuels"—A. W. Trusty, Arkansas Fuel Oil Co.

"Evaluation of Crudes in the Laboratory"—Dr. L. C. Kemp, The Texas Co.

7:00 P.M.—COLISEUM

"Testing Methods for Determining Quality of Used Lubricating Oils"—B. D. Ward, Humble Oil & Refining Co.

"Oxidation of Lubricating Oils"—Dr. H. A. Ambrose and Dr. C. W. Montgomery, Gulf Research Development Corp.

Directional Drilling Committee Program—Directional Drilling Committee:
G. B. Corless, Chairman; Humble Oil & Refining Co.
Ed G. Lenzner, Asistant Chairman; General Manager, Oil-World Exposition.
Alexander Anderson, Alexander Anderson, Inc.
H. John Eastman, Eastman Oil Well Surveying Co.
R. S. Hyer, Sperry-Sun Well Surveying Co.
A. B. Patterson, The Texas Co.
M. L. Cashion, Gulf Production Co.
D. B. Collins, Shell Petroleum Corp.

10:00 A.M.—COLISEUM

Program Combined with Drilling Practices Committee:
Mechanical Engineering Day—Sponsored by American Society of Mechanical Engineers, Petroleum Division and Directional Drilling Committee; Combined under Drilling Practices Committee:
Joe H. Russell, General Chairman; Assistant Vice President Gulf Oil Corp.
G. B. Corless, Vice Chairman; Humble Oil & Refining Co.
W. F. Herbert Vice Chairman; Chairman, Program Committee, A.S.M.E.

"Progress Report on Fluid Meters Research"—E. E. Ambrosius, Director, Fluid Meter Research Dept., University of Oklahoma.

10:30 A.M.—COLISEUM

"Rotary Engines"—Nathan Janco, Reed Roller Bit Company.

11:00 A.M.—COLISEUM

"Historical Review of Production Experiences on Deviated Wells"—H. John Eastman, Eastman Oil Well Surveying Co.

11:30 A.M.—COLISEUM

"Oriented Coring"—A. B. Patterson and J. K. Butler, The Texas Company.

2:00 P.M.—COLISEUM

"Well Surveying Methods"
(a) **Oriented Surveys**—Norman L. Dorn, Lane-Wells Co.
(a) **Gyroscopic Surveys**—R. S. Hyer, Sperry Sun Well Surveying Co.
(c) **Magnetic Surveys**—James K. Hughes, Eastman Oil Well Surveying Co.

2:30 P.M.—COLISEUM

"Technique of Controlled Drilling"—Douglas Ragland, Humble Oil & Refining Co.

3:00 P.M.—COLISEUM

"Sulphate Resisting Cement"—Sven Rordam, Trinity Portland Cement Co.

3:30 P.M.—COLISEUM

"Trend in Casinghead Gasoline Plants"—Frank Noble, Humble Oil & Refining Co.

1:30 P.M. to 11 P.M.—COLISEUM

Technical Films of Various Leading Manufacturers of Equipment—U. S. Bureau of Mines Motion Pictures.

ALL DAY—COLISEUM

Motor Transportation Division of the Oil Companies—Committee as follows:
T. G. Price, Chairman; Shell Petroleum Corp.
Leo New, Vice Chairman; United Gas System.
Oscar Lynch, Humble Oil & Refining Co.
E. B. Tilley, Gulf Oil Corp.
Jack Parker, Transportation Equipment Co.
Roy Fike, Mid-Continent Oil Co.
J. E. Johnson, Tide Water Associated Oil Co.
Alex Muncie, Pure Oil Co.
Lonnie Smith, Sun Oil Co.
S. C. Bovell, Magnolia Petroleum Co.
Sam Phillips, Sinclair-Prairie Oil Co.
Colonel T. D. Harris, Continental Oil Co.

7:00 P.M.—COLISEUM

U. S. Army Band, 69th Coast Artillery, Fort Crockett.

U. S. Army Aviation Division Searchlight Display and Sound Detector Maneuvers—Presented by 69th Coast Artillery, Fort Crockett.

7:30 P.M.—COLISEUM

Humble Oil & Refining Company Glee Club.

(Continued next page)

"A substantial saving to us!"

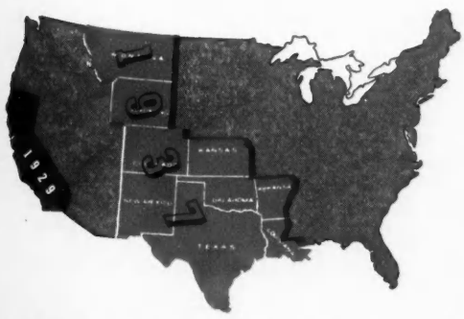
TOTCO
DRIFT RECORDER

"The successful operation of the TOTCO instrument means a substantial saving to us. Every failure is more costly to us than the manufacturing of the instrument for the reason that our drilling speed is controlled by the information which we get from TOTCO."

The above statement is included in a bulletin issued by the general drilling superintendent of a major oil company. This bulletin was issued to bring out the economical necessity for taking the proper care of TOTCO equipment.

His opinion is concurred in by many officials of other major oil companies who have used the information provided by TOTCO, and have *developed methods* to take advantage of this information.

The TOTCO Drift Recorder determines verticality *accurately, dependably, quickly, safely, easily* and *economically*. Use TOTCO records to develop methods to get straight holes at *less cost!*



8 YEARS OF PROGRESS

INTRODUCED IN MID-CONTINENT IN MAY, 1935 . . . NOW OPERATING IN 10 STATES

California oilfields in 1929 . . . Kansas, Colorado, Arkansas, Louisiana, New Mexico, Montana, Oklahoma, Texas, Wyoming, Alaska and Canada oilfields in 1937. That's the history of the increasing use of TOTCO Drift Recorders in eight short years. *There's a reason! Ask your nearest Distributor or write direct.*

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R. D. Wallace, Continental Bldg., Casper, Wyoming, *Servicing Rocky Mountain Area*

California Machinery & Supply Co., 2449 Hunter St., Los Angeles, California

**TOTCO Drift Recorders are leased on a monthly rental basis. While in service, they are inspected at intervals by our experienced Service Experts*

SEE OUR EXHIBIT AT THE OIL-WORLD EXPOSITION

MORE THAN 200 OPERATORS HAVE PROVED TO THEMSELVES THE VALUE OF TOTCO RECORDS TAKEN AT FREQUENT INTERVALS WHILE DRILLING

TECHNICAL OIL TOOL CORP. LTD.
1311 NORTH HAVENHURST DRIVE
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PROGRAM during week of OIL-WORLD EXPOSITION

WEDNESDAY, OCTOBER 13

9:00 A.M. and 1:30 P.M.—COLISEUM

Conference on Refinery Measurement and Control—Presented by Refinery Committee; Sponsored by:
A. & M. College of Texas.
C. W. Crawford, Head of Department of Mechanical Engineering, Rice Institute.
J. H. Pound, Head of Department of Mechanical Engineering, Rice Institute.
H. C. Degler, Head of Department of Mechanical Engineering, University of Texas.

Arranged by Measurement and Control Sub-Commitee:
M. N. Dannenbaum, Sub-chairman; M. N. Dannenbaum Co.
R. L. Mallory, Brown Instrument Co.
Joe Miller, Humble Oil & Refining Co.

9:00 A.M.—COLISEUM

"Measurement and Control in Refinery Processes"—Philip Darling, Pan American Refining Corp.

"Measurement of Temperature by Thermometry"—A. J. Fleig, Taylor Instrument Co., Rochester, N. Y.

1:30 P.M.—COLISEUM

"Potentiometer Pyrometry"—G. C. Graf, Leeds & Northrup Co., Philadelphia, Pa.

"Development Trends of Pyrometry"—C. O. Fairchild, C. J. Tagliabue Manufacturing Co., Brooklyn, N. Y.

"Measurement of Flow"—A. F. Benson, American Meter Co., Erie, Pa.

7:00 P.M.—COLISEUM

Engineering Students Program—Arranged by Engineering Sub-Committee:
H. C. Degler, Chairman; Head of Department of Mechanical Engineering, University of Texas.
C. W. Crawford, Head of Department of Mechanical Engineering, A. & M. College of Texas.
J. H. Pound, Head of Department of Mechanical Engineering, Rice Institute.

Presentation of papers by Engineering Students from Colleges of the Southwest. Subjects to be confined to the Production, Transportation, Refining, Marketing, and Use of Petroleum. $200.00 in cash prizes to be awarded.

ALL DAY—RICE HOTEL

Registration—Independent Petroleum Association Members—Officers of the Independent Petroleum Association of America are as follows:
Charles F. Roeser, President.
H. B. Fell, Executive Vice President.
Russell B. Brown, General Council.
T. J. Stewart, Assistant to President.
C. C. Buchner, Executive Manager.

Committee Meetings—Rice Hotel.

1:30 P.M. to 11 P.M.—COLISEUM

Technical Films of Various Leading Manufacturers of Equipment—U. S. Bureau of Mines Motion Pictures.

ALL DAY—BRAE-BURN COUNTRY CLUB

Oil Men's Golf Tournament

ALL DAY—GLENBROOK COUNTRY CLUB

Rocky Mountain Oil Men's Association Barbecue and Golf Tournament.

ALL DAY—COLISEUM

Motor Transportation Division of the Oil Companies:

7:00 P.M.—HOUSTON CLUB

Dinner, Speakers, Entertainment, Floor Show—For members and guests of Motor Transportation division of the oil companies.

7:00 P.M.—RIVER OAKS COUNTRY CLUB

Foreign Representatives Banquet—Courtesy extended all foreign visitors. Attendance limited to Directors and Foreign Visitors. Foreigners will be furnished free tickets.

Chairman: R. L. Dudley, Secretary-Treasurer, Oil-World Exposition; President, Gulf Publishing Company. Visitors from abroad should register on arrival at Exposition headquarters.

7:00 P.M.—COLISEUM

U. S. Army Band—69th Coast Artillery, Fort Crockett.

U. S. Army Aviation Division Searchlight Display and Sound Detector Maneuvers—Presented by 69th Coast Artillery, Fort Crockett.

THURSDAY, OCTOBER 14

9:00 A.M. and 1:30 P.M.—COLISEUM

Conference on Refinery Measurement and Control—Presented by Refinery Committee.

9:00 A.M.—COLISEUM

"Selection of Valves for Automatic Control"—R. A. Engel, Fisher Governor Co., Marshalltown, Iowa.

"Measurement of Pressure"—M. J. Smith, Crosby Steam Gage & Valve Co., New York, N. Y.

1:30 P.M.—COLISEUM

"Regulation of Pressure"—Paul A. Condit, Mason-Neilan Regulator Co., Boston, Mass.

"Control of Temperature"—H. M. Schmidt, Brown Instrument Co., Philadelphia, Pa.

"Control of Flow"—J. B. McMahon, Foxboro Co., Foxboro, Mass

10:00 A.M., ALL DAY—RICE HOTEL

Independent Petroleum Association Convention Program.

Invocation.

Address of Welcome.

President's Annual Address. Chas. F. Roeser, President, Fort Worth, Texas.

"National Legislative Trends in the Petroleum Industry." Russell B. Brown, General Counsel, Washington, D. C.

Report of Committee on Credentials, Rules and Order of Business. Bryan W. Payne, Chairman, Tyler, Texas.

Oil Men's Popular Luncheon. 1000 plates. Open to the public. Main Ballroom, Mezzanine. Orchestra and Quartet.

2:00 P.M.—RICE HOTEL

Independent Petroleum Association Convention Program.

Report of Committee on Unnecessary and Excessive Drilling. C. P. McGaha, Chairman, Wichita Falls, Texas.

Discussion.

"Pollution and Waste Disposal Measures." J. D. Collett, Fort Worth, Texas.

Report of Domestic Asphalt Committee. Paul G. Blazer, Chairman, Ashland, Kentucky.

Discussion.

1:30 P.M.—COLISEUM

Interstate Oil Compact Commission—The Commission is as follows:
Col. Ernest O. Thompson, Chairman; Railroad Commissioner, Austin, Texas.
Hon. Art L. Walker, Secretary, Oklahoma City.
Hon. Hiram M. Dow, First Vice Chairman, Oklahoma City.
Hon. William Bell, Second Vice Chairman, Oklahoma City.
Governor James V. Allred of Texas.
Governor Henry Horner of Illinois.
Governor Clyde Tingley of New Mexico.
Governor Teller Ammons of Colorado.
Governor E. W. Marland of Oklahoma.
Governor W. A. Huxman of Kansas.

1:30 P.M. to 11:00 P.M.—COLISEUM

Technical Films of Various Leading Manufacturers of Equipment—U. S. Bureau of Mines Motion Pictures.

7:00 P.M.—COLISEUM

U. S. Army Band—69th Coast Artillery, Fort Crockett.

U. S. Army Aviation Division Searchlight Display and Sound Detector Maneuvers—Presented by 69th Coast Artillery, Fort Crockett.

7:30 P.M.—COLISEUM

Humble Oil & Refining Company Glee Club.

8:30 P.M.—CITY AUDITORIUM

Oil Exposition Wrestling Match.

(Continued next page)

PROGRAM during week of OIL-WORLD EXPOSITION

FRIDAY, OCTOBER 15

"Petroleum Day"—Proclamation by Governor James V. Allred.

9:30 A.M.—RICE HOTEL

Independent Petroleum Association Convention Program.

The Necessity and Justness of 27½ Per Cent Depletion Clause in Federal Revenue Bill.

Report of Tax Policy Committee. E. H. Moore, Chairman, Tulsa, Oklahoma.

Discussion.

Report of the Public Relations Committee. Burdette Blue, Chairman, Bartlesville, Oklahoma.

Discussion.

Report of Royalty Owners Committee. Robert H. Wood, Chairman, Tulsa, Oklahoma.

Discussion.

Report of Constitution and By-Laws Committee. Marvin Lee, Chairman, Wichita, Kansas.

Discussion.

12:00 NOON

Luncheon for all I. P. A. A. delegates at Hughes Tool Company Plant.

2:00 P.M.—RICE HOTEL

Independent Petroleum Association Convention Program.

"The Relation of Imports to Domestic Production." Wirt Franklin, Wirt Franklin Petroleum Corp., Oklahoma City, Okla.

Report of Membership Committee. Ralph T. Zook, Chairman, Bradford, Pennsylvania.

Discussion.

Report of Activities Committee. C. A. Lester, Chairman, Dallas, Texas.

Discussion.

Report of Nominating Committee. E. L. Smith, Chairman, Dallas, Texas.

Discussion.

Report of the Resolutions Committee. Wirt Franklin, Chairman, Oklahoma City, Oklahoma.

Discussion.

7:00 P.M.

Annual Banquet, Main Ballroom, Rice Hotel. 1500 Plates. Formal and Stag.

Address. Hon. Harold L. Ickes, Secretary of the Interior.

Orchestra and Entertainment.

Followed by Dance for Independent Petroleum Association of America Delegates and Ladies. Courtesy Mission Manufacturing Company.

9:00 A.M and 1:30 P.M.—COLISEUM

Conference on Refinery Processes—Presented by Refinery Committee; Arranged by Refinery Process Sub-Committee:

George Reid, Sub-Chairman; Editor, The Refiner.
O. E. Berg, Babcock & Wilcox Tube Co.
Joe Peddie, Maintenance Engineering Corp.

9:00 A.M.—COLISEUM

"Production of Organic Chemicals from Petroleum and Natural Gas"—Dr. C. R. Wagner, Dr. M. B. Cooke and S. R. Swanson; The Pure Oil Co. and Alco Products, Inc.

"Catalytic Polymerization and Its Application in Refining"—Dr. Gustav Egloff, Universal Oil Products Co.

"Combination Selective Cracking"—Dr. E. R. Smoley, The Lummus Co.

1:30 P.M.—COLISEUM

"Metallurgy in Petroleum Refining Processes"—E. S. Dixon, The Texas Co.

"Gasoline Treating and Sweetening Processes"—Dr. C. W. Rippie, Solvay Sales Co.

"Extraction of Salts from Refinery Stocks by the Electrical Process"—T. N. St. Hill and G. B. Hanson, Petroleum Rectifying Co.

12:00 NOON—HUGHES TOOL CO. PLANT

Buffet Luncheon for Independent Petroleum Association Members.

12:30 P.M.—HOUSTON CLUB

California Oil Men's Association Luncheon.

1:30 P.M. to 11:00 P.M.—COLISEUM

Technical Films of Various Leading Manufacturers of Equipment—U. S. Bureau of Mines Motion Pictures.

1:30 P.M.—COLISEUM

Interstate Oil Compact Commission.

7:00 P.M.—RICE HOTEL

Annual Banquet—Independent Petroleum Association—Sponsored by Houston Wildcat Committee. Address by Secretary of the Interior Harold L. Ickes.

7:00 P.M.—COLISEUM

U. S. Army Band—69th Coast Artillery, Fort Crockett.

U. S. Army Aviation Division Searchlight Display and Sound Detector Maneuvers—Presented by 69th Coast Artillery, Fort Crockett.

SATURDAY, OCTOBER 16

9:30 A.M.—RICE HOTEL

Independent Petroleum Association Convention Program.

Meeting of the Board of Directors. Election of Officers. Report of Budget and Finance Committee. N. T. Gilbert, Chairman, Tulsa, Oklahoma.

Meeting of the Executive Committee.

9:00 A.M.—COLISEUM

New Patents and Inventions Committee:
Lester B. Clark, Chairman, Patent Attorney.
Ed G. Lenzner, Assistant Chairman.

"Judging of New Patents"

11:00 A.M.—TEXAS STATE HOTEL

Safety and First Aid Committee Meeting; Luncheon.
C. J. Cohlin, Chairman; Texas Co.

Program:

1. Making Full Use of the Practical Protective Equipment Available:
(a) Explanation and Demonstration of Equipment—Vic Hayslip, Humble Oil & Refining Co.
(b) Methods Employed to Insure that Equipment is Used—Frank Werner, American Petroleum Co., and Republic Production Co.

2. Methods for Developing Safety Meeting Programs and Conducting the Meetings in a Manner to Make Them Interesting and Instructive:
(a) The value of Safety Meetings in the Accident Prevention Program—Louis Emden, Gulf Oil Corp.
(b) The Value of Foremen's Meetings and Subjects that Should be Considered at Such Meetings—C. B. Swanner, Magnolia Petroleum Co.
(c) How Often Safety Meetings Should Be Held and How They Should Be Organized—F. J. Rousseax, The Texas Co.
(d) Developing Material for Safety Meeting Programs—Harry Jones, Shell Petroleum Corp.

ALL DAY—COLISEUM

First Aid Contest—Committee as follows:
J. J. Delahide, Chairman; E. D. Bullard Co.
Ed G. Lenzner, Assistant Chairman; General Manager, Oil-World Exposition.
Geo. J. Gruber, Mine Safety Appliances Co.
R. B. Roaper, Safety Engineer, Humble Oil & Refining Co.
Claude Liles, Safety Engineer, Magnolia Petroleum Co.
Pete Keegan, Safety Engineer, Shell Petroleum Corp.
Tom Brown, Safety Engineer, Gulf Production Co.
Jerry Lockwood, Safety Engineer, Empire Oil & Refining Co., Bartlesville.
Cecil Hightower, Safety Engineer, United Gas Public Service Co.
C. A. Miller, Safety Engineer, The Texas Co.

1:30 P.M.—COLISEUM

Technical Films of Various Leading Manufacturers of Equipment—U. S. Bureau of Mines Motion Pictures.

2:00 P.M.—RICE STADIUM

Football Game—Rice Institute vs. Tulsa University.

7:00 P.M.—COLISEUM

U. S. Army Band. 69th Coast Artilley, Fort Crockett.

U. S. Army Aviation Division Searchlight Display and Sound Detector Maneuvers. Presented by 69th Coast Artillery, Fort Crockett.

7:30 P.M.—COLISEUM

Humble Oil & Refining Co. Glee Club.

INDEX to Oil-World Exposition DISPLAY DESCRIPTIONS

The following pages of this issue of **The OIL WEEKLY** are devoted to brief descriptions of the products on display at the **Oil-World Exposition** by various manufacturers and supply concerns. Below is an index to the page on which the material appears for the various firms that cooperated with us.

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Call McCULLOUGH for Quick, Safe, Dependable GUN PERFORATOR SERVICE Anywhere!

Unretouched photo of casing perforated in the well with a McCullough Gun Perforator. Note the even spacing of the clean, ½-inch holes.

WHEN we say "Anywhere" we mean just that. All of the equipment required to perforate the casing in your well with the McCullough Gun Perforator is carried in our light, fast service cars. Bad roads are not a hazard. And if your well is in the bayou country, in a jungle, or on a mountain side we can use a row boat or a mule to get to you quickly—without costing you money in loss of time.

The McCullough Gun Perforator is mechanically fired—safely, and at the exact point in the casing where you want the perforations made. It is run on the sand-line or other ordinary line with which the well is equipped. Our service crews are efficient and experienced, with thousands of safe, successful Gun Perforating jobs to their credit. . . . Call McCullough, **any time.**

SEE THE McCULLOUGH EXHIBIT AT THE HOUSTON OIL SHOW - Booth 1322

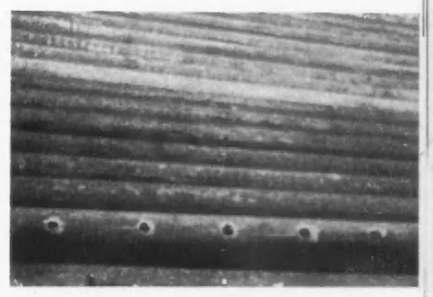
Gun Perforator
Rotary Jars, Double Acting (Up and Down)
Internal Casing Cutters
Drill Pipe Cutters
Rotary Releasing Spears
Rotary Releasing Sockets
Drilling and Fishing Safety Joints
Casing Roller and Swage

McCULLOUGH TOOL COMPANY

LOS ANGELES • 2063 East Slauson Ave.

HOUSTON • 4000 Capitol Ave.

BRANCHES: Corpus Christi, New Iberia, Bakersfield, Ventura



Clean, evenly-spaced PERFORATIONS

McCullough Gun Perforators are made in all required sizes from 2¾-inch O.D. up, to perforate any size casing. Perforations produced are ¼-inch, ⅜-inch, ½-inch, ⅝-inch and ¾-inch diameter. The hardened steel projectiles easily perforate the casing, whether one or more strings, and drive on into the formation—producing clean, round holes without fracturing the pipe. Simultaneous mechanical firing insures even spacing of the perforations and full efficiency from each load.

Whatever your Gun Perforating problem, and wherever your well may be—CALL McCULLOUGH.

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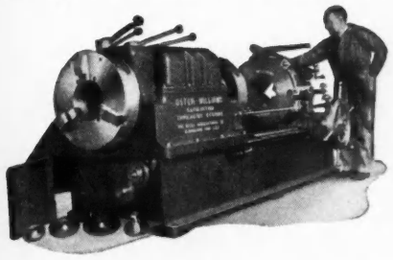
Oster Manufacturing Company

▪ ***Threading Equipment***

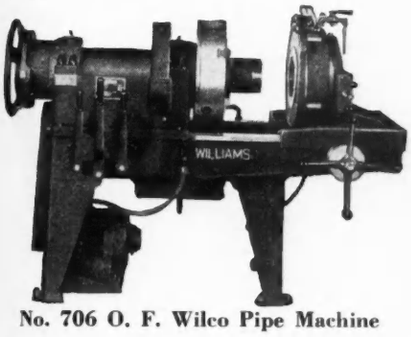
The Oster Manufacturing Company, Cleveland, Ohio, is featuring a number of tools and machines which are a part of its broad line of threading equipment. Among other machines is the No. 8-XHD



No. 8XHD Rapiduction Pipe Threading and Bucking-up Machine

Heavy Duty Rapiduction pipe threading and bucking-up machine which was designed especially for oil field requirements. This machine has a capacity covering all sizes up to 8⅝-inch O.D., using only one die head and only one set of chasers for each pitch.

There is being shown in the Oster booth a No. 706 O. F. Wilco pipe thread-

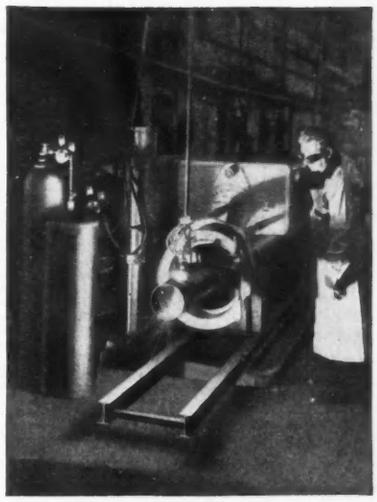


No. 706 O. F. Wilco Pipe Machine

ing machine for cutting full length correctly tapered A.P.I. threads without the use of a taper attachment. This machine has a capacity up to 6⅝-inch O.D., using only one die head and only one set of extra wide chasers for each pitch.

In the bolt threading field is exhibited the No. 900 Series Single Spindle Bolt

No. 900 Series Rapiduction Bolt Threader



No. 222 Torch Cutting Machine

Threading Machines, capacity ½ to 2¼ inches, inclusive.

A new development, the improved No. 222 torch cutting machine for pipe intersections also is demonstrated.

% Proportioneers, Inc. %-Builders Iron Foundry

▪ ***Chemical Proportioners***

Visitors to Booth 932 will find %Proportioneers-Builders Iron Foundry displaying an assortment of Chemical Proportioning Equipment suitable for a wide variety of services.

Equipment on display includes:

Standard units offered for gum inhibiting, coloring, and treating gasoline in transit.

Equipment for acid treating or blending of lube oils.

Equipment furnished for blending gasolines and asphalts.

Dry feeders and proportioning pumps controlled to feed in proportion to flow through orifice plates or Venturi tubes.

Feeders for handling highly corrosive treatment of large flows and for constant rate chemical feeding.

Steam, gas, air, and liquid meters.

Twin Disc Clutch Company

▪ ***Clutches and Power Take-Offs***

Twin Disc Clutch Company is exhibiting in Booths 432 to 434.

Twin Disc is showing several different types of clutches and power take-off units. The Model E clutch line is shown, which is available in single or 2-plate assemblies, ranging from 14 to 30 inches in diameter.

Two numbers of standard power take-off units, numbers X8246 and X8249, are shown. This line of equipment is applicable to industrial engines and is built with clutches ranging in sizes from single plate 7½ inches, to double palte, 18 inches.

Twin Disc also is exhibiting several numbers from its line of CC clutches and stub shaft mounted clutches.

Industrial Scientific Supply Company

Industrial Scientific Supply Company, Fort Worth and Houston, Texas, exhibiting Booth 249 is showing a full line of Taylor instruments.

▪ ***Control Instruments***

The new Taylor Fulscope Micromax Controller is on display with a working model of this new air-operated potentiometer controller, which combines the outstanding values of the Taylor Fulscope Controller and the electrically operated Micromax, for those applications where smooth proportional valve action is imperative and the potentiometer principle of temperature measurement is preferred.

The standard Taylor Fulscope Recording Controller for temperature, pressure, flow and liquid level is shown, with its universal sensitivity adjuster.

For applications where a record is not desired, the Taylor Indicating Fulscope Controller is demonstrated.

In conjunction with these is the Taylor Dubl-Response Controller for difficult control problems where timelag and load change require a positive reset mechanism.

▪ ***Taylor Valve***

The Taylor Evenaction Motosteel Valve of all-welded steel construction which has great strength and light weight, is on display with the Taylor Valv-Precisor which positions the diaphragm valve disc precisely in proportion to the air pressure changes from the controller.

Beaver Pipe Tools, Inc.

▪ ***Pipe Tools***

Beaver Pipe Tools, Inc., Warren, Ohio, is showing its full line of Beaver tools. The center of attraction is the demonstration of the company's Model-A portable pipe machine.

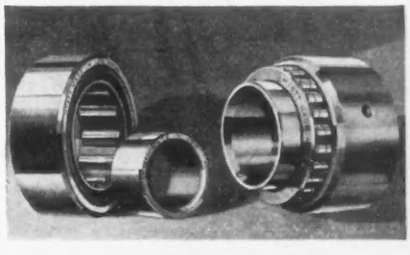
Hyatt Bearings Division General Motors Corporation

▪ ***Roller Bearings***

Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey, exhibits in spaces 704 and 706 a complete line of roller bearings used in oil field machinery.

Shown are two general types of Hyatt roller bearings, known as Hy-Load solid-roller radial bearing, and the wound-roller heavy-duty bearing.

Hyatt bearings are made in all sizes and types for various oil field machinery.



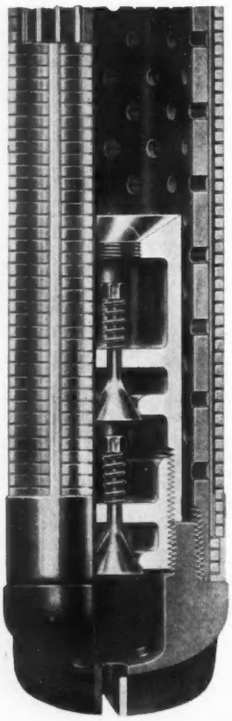
Hyatt Roller Bearings

Howard Smith Company

Howard Smith Company, Houston, is exhibiting Stancliff screen and other products in Booths 1205 and 1207.

▪ *Stancliff Screens*

Stancliff well screens have full depth, full width spacing lugs rolled into the square wrapping wire. The lugs space the wire at the top and at the bottom. The square wire helps to resist a change in gauge from abrasion and corrosion.



Stancliff Well Screen in combination with Stancliff Back-Pressure Valve and Set Shoe Assembly

The wire wrapping may be furnished in galvanized steel, brass, bronze, Admiralty and stainless steel.

The ribs are laid on the outside of the pipe, and are of the same metal as the wrapping wire.

Stancliff screen flow channels are formed by the ribs to increase screening efficiency and reduce fluid velocity with the consequent minimizing of sand cutting. This construction also makes them easy to clean.

Perforations in the pipe are staffered with one row of holes under each flow channel.

▪ *Stancliff Back-Pressure Valve and Set Shoe Assembly*

This set shoe may be screwed into an inserted thread in bottom of the screen or fastened with a collar to the standard thread of screen pipe. The brass wash ring is beveled to facilitate entry of wash pipe, and is threaded for an emergency plug. Heavy brass springs keep the valves seated firmly when pressure is relieved. The streamlined cone-shaped valves are designed to prevent trapping of trash under the valve seat. The guide plug is spot welded to prevent screwing off when drilling through the shoe to deepen the well.

The cast iron guide plug protects the screen and valves when running the liner in the well. This plug may be wing type, as shown, or round nosed if preferred. This set shoe is compact and takes up little vertical space in the hole.

Allen, Sproull & Allen

Allen, Sproull & Allen, 1504 Shell Building, Houston, Texas, is exhibiting equipment of various manufacturers which they represent. Among the various items on display are the following:

▪ *Gauges*

Pressure gauges with pulsation damping attachment, as well as various gauges for pipe line, field, and refinery use, manufactured by United States Gauge Company, 44 Beaver Street, New York City.

▪ *Sealing and Coating Material*

National Boiler Improvement Company, Washington, D. C., is displaying at the booth of Allen, Sproull & Allen, Copalite, a material for sealing pipe threads for high pressures and temperatures, as well as for sealing hand holes and man holes of high pressure boilers. Another product of this concern is Rustnil, a coating resistant to gasoline, oils, hydrocarbon, alkalis, acid, ammonia, creosote fumes and other liquid gasses.

▪ *Wrenches*

The exhibit includes various types of pipe wrenches and pipemaster, manufactured by Erie Tool Works, Erie, Pennsylvania.

▪ *Valves and Fittings*

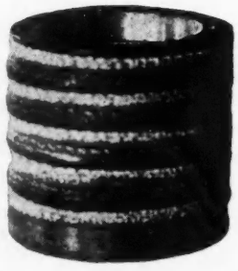
On display are various types of valves and fittings manufactured by the following concerns: D. T. Williams Valve Company, Cincinnati, Ohio; M & H Valve & Fittings Company, Anniston, Alabama; Pressure-Trap Valve Company, Houston, Texas; Stanley G. Flagg & Company, Philadelphia, Pennsylvania, and Kunkle Valve Company, Fort Wayne, Indiana.

The Texacone Company

▪ *Packing*

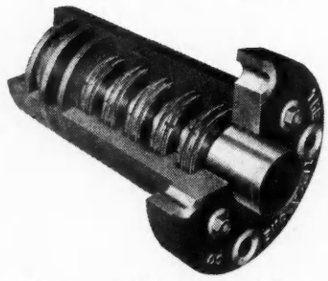
The Texacone Company, Dallas, Texas, is displaying its line of high pressure packing and specialties.

The basic construction of "Texacone" moulded packing rings is a series of laminations joined in a hinge-like manner by folds of the material, a piece of the material being processed into pleats having the desired ring shape. They are termed "accordions" because of their bellows-like appearance. These rings are particularly useful for valve stem, pump rods and plungers on high pressures and temperatures having reciprocating motion.



Texacone Accordion Ring

Texacone metallic packing incorporates pressure control and friction distribution by new ring design. Now being made for corrosive gases and vapors on compressor and steam rods.



Texacone Metallic Packing

Flexibestos v-spiral is the latest improvement in accordion ring construction and is shown at the Houston show for the first time. The construction is a continuous moulded spiral form, of v-ring cross-section. The diameter of the spiral may be varied at will within commercial ranges and rings cut off therefrom to fit the particular diameter desired. About 15 kinds of packing will be made for each width, each of a semi-universal nature so that many conditions may be handled by each variety.

Flexibestos V-Spiral Packing

The design is intended to reduce warehouse stocks by providing universality of application from a few sizes. Suitable for all rods, plungers and valve stems, and for some centrifugal work.

Vortox Manufacturing Company

▪ *Air Cleaners*

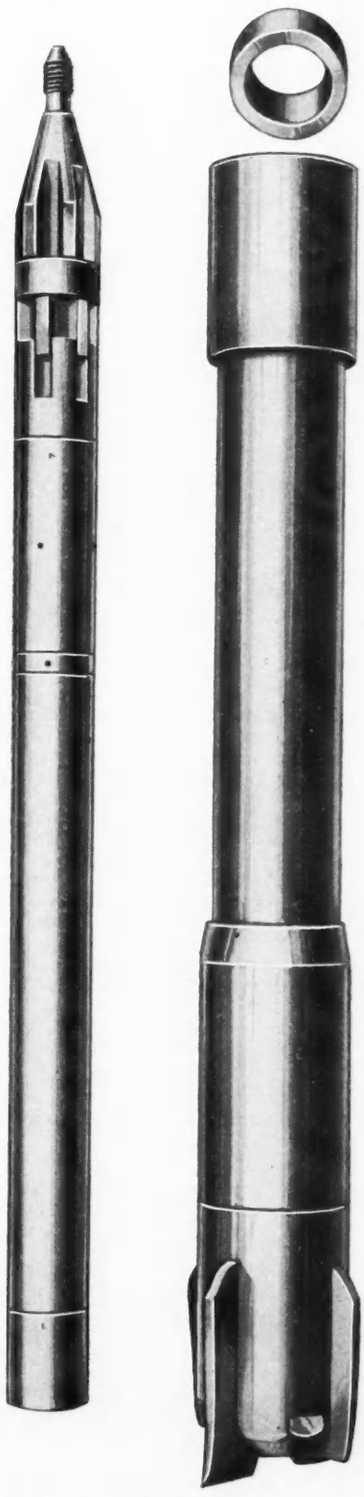
Vortox Manufacturing Company is exhibiting air cleaners, fittings, and assemblies particularly well suited for the horizontal, one-cylinder, oil well pumping engines. The exhibit is located in Booth 656, in the main auditorium building.

The company also has a demonstrator in its booth. This demonstrator is so arranged that the oil action in the air cleaner is clearly visible to visitors.

L. S. Starrett Company

▪ *Tools, Saws, Tapes, Etc.*

L. S. Starrett Company, Athol, Mass., is featuring a general line of precision tools, hack saws, steel tapes. plumb bobs, dial indicators, and other machine shop tools.



Pennington's Signaling Core Barrel.
Wire Line Type.

IT IS NOT SO IMPORTANT THAT:

Pennington Signaling Core Barrels indicate instantly when the core tube lands in place ready to receive the core;

Signaling Core Barrels indicate instantly if too much weight is being let down on the bit, which might "burn" the core;

Signaling Core Barrels do not require "burning in" the core to prevent loss of section;

Signaling Core Barrels indicate instantly when the core tube is filled with core, preventing the core from being jammed into tube and disintegrated;

Signaling Core Barrels break off and bring out the hardest of rock cores, yet do not cut up and disintegrate the softest;

Signaling Core Barrels are rapid — for example, a 9-foot core laid down each 21 minutes elapsed time from 6320 in a well near Corpus Christi recently;

Signaling Core Barrels have so far recovered a greater total length of cores than the depth measured to cut them, indicating 100% and over core recovery;

No Signaling Core Barrel has ever stuck;

Signaling Core Barrels have not lost a single customer.

But . . .

IT IS IMPORTANT THAT:

Signaling Core Barrels are commercializing deep production that an adequate supply of oil will be had.

UNITED STATES
HEAT TREATING COMPANY, INC.
SAN ANTONIO, TEXAS

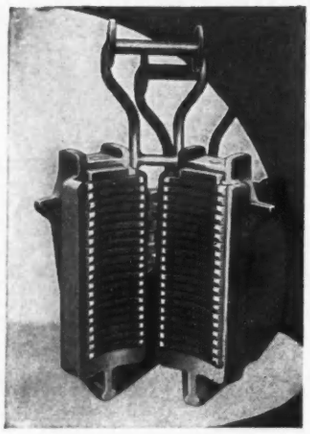
Mission Manufacturing Company

The exhibit of Mission Manufacturing Company, Houston, is in booths 304-307-405-407. Included in the exhibit are the following products:

▪ *Mission Rotary Slips, Model 36*

Mission Slips are distinguished by a unique principle of "Rolling Dogs" that roll away from the pipe as it is pulled. This assures instant release making for fast pulling.

The broad friction face of the dogs together with the rolling dog principle



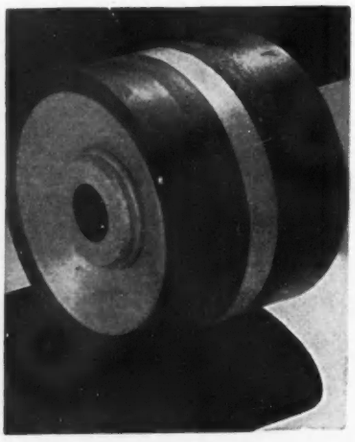
Mission Rotary Slips

which gives a gradual, cushioning grip, eliminates danger of slips cutting or crushing pipe.

The dogs are quickly and easily replaced on the derrick floor, saving costly delays in taking slips to shop. The body of the slip is practically indestructible, assuring buyers practically a permanent investment.

▪ *Mission Slush Pump Pistons*

Among the features of the Mission Pistons are the following: Replaceable rubbers on a long-lasting body, saving money formerly invested in continuously buying complete new pistons;

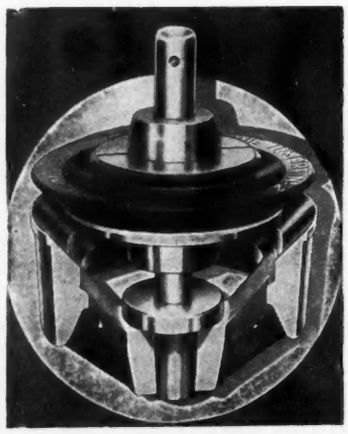


Mission Slush Pump Piston

principle of more-rubber and less-metal to give greatly increased wiping surface, eliminating by-passing and increasing the life of liners and pistons; extreme light weight, eliminates drag; drop forged, chrome nickel body of one-piece construction, resists any pressure.

▪ *Mission Silver Top Valves*

These use the Mission principle of a long-lasting seat with replaceable bushings that take the terrific blows.



Mission Slush Pump Piston

Saves labor of changing seats often and saves money formerly invested in continuously buying new seats where the wear is taken by the seat itself, the manufacturer claims.

▪ *Mission Valveless Swabs, Tandem Model*

Operates on a unique, new split-rubber principle. On the down-stroke half of each rubber rises above the stationary half, allowing an area for fluid passage larger than the area of flow around the A-P-I pin. Makes for unusual falling speed. On the up-stroke, the movable half of each rubber drops back beside its other half.

Safety features are: Gas pressure will open split rubber, permitting gas to bypass, resuming its load without loss after gas has passed. No loose line over derrick floor to endanger crew.

Atlas Engineering Works

▪ *Tubing and Braden Heads*

Atlas Engineering Works, Houston, is featuring its Type A-3 tubing and braden heads. These heads are exhibited individually as well as in assemblies of Christmas trees. The patented all-metal seal ring which eliminates all form of fibrous or composition packing is incorporated in each of these heads. This product is available in a combination of braden and tubing heads or as a single item to be adapted to a Christmas tree of the customer's choice.

▪ *Other Products*

Other items displayed by Atlas are: Type A tubing heads, high-pressure pumping heads; Type B, tubing heads, braden heads of conventional design in the more popular sizes; adapter flanges; Atlas reversible hydraulic puller and high-pressure fittings.

National Supply Company

National Supply Company, Toledo, Ohio, is using Booths 121 to 135, in which a large line of drilling and producing equipment is being shown. Many of the products are described in the following paragraphs:

▪ *National 14-D Band Wheel Power*

A new development in band wheel pumping powers that offers complete protection from dust and moisture as well as other features heretofore found only on geared powers. Oil seals operate against all machined surfaces, and a flood of clean oil is supplied constantly to every working surface by the National patented circulating oiling sys-

National 14-D Band Wheel Power

tem. A single eccentric construction together with the use of Timken bearings has made it possible to provide an eccentric strap of unusual width and still retain a very compact and rigid design. An improved type of band wheel offers unusual ease of erection and alignment, together with permanent diametrically correct rim sections. Band wheels are 24 inches by 24 inches diameter and face. Eccentric stroke may be 24 inches, 30 inches or 36 inches as specified.

▪ *Type THD-601 Unit Pumper*

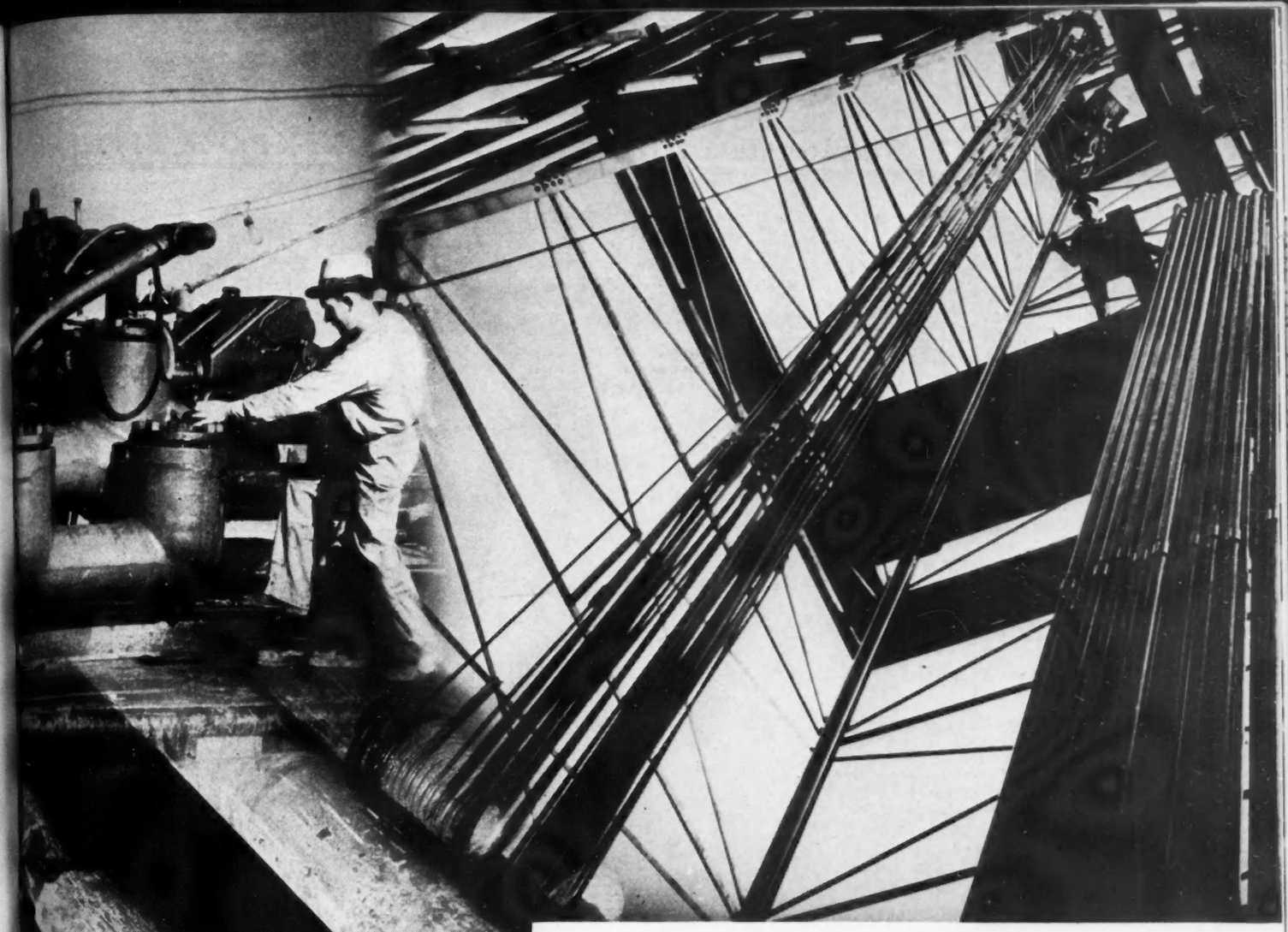
A twin crank self-contained unit pumper with equalized double pitman and four-legged derrick type samson post. The reduction gear is rated at 28 nominal horsepower at 20 strokes per minute and is of the Sykes herringbone type. A special feature is the National

Type THD-601 Unit Power

disc cranks with counterweights adjusted by power. There is no lifting and the weights cannot slide off.

▪ *HD-80 Reduction Gear*

A reduction gear for heavy-duty service that may be used for both single and multiple well pumping by means of a back-crank arrangement. It also may be furnished to drive a hoist



• Molybdenum steels and irons are setting new standards for dependability in every sort of equipment used in oil production.

From crown block to tool bit, Molybdenum steels help to make hole faster, and to do it more economically. They have the strength to stand any sort of use or abuse that service demands.

Molybdenum steels in sucker rods and pump parts hold down pumping costs. They assure continuous production, and cut maintenance costs and time.

The records made by Molybdenum irons are equally good. To cite but one example: they are adding greatly to life and efficiency of pumps—slush, deep well and metering.

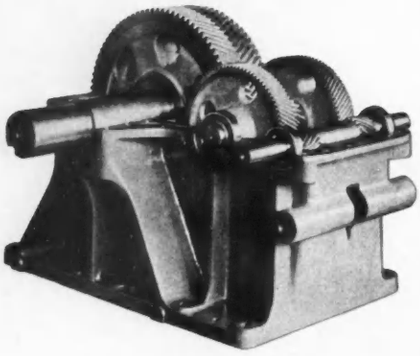
It will pay any one interested in more efficient drilling and pumping equipment to investigate Molybdenum steels and irons.

Climax has practical application and performance data on a wide range of equipment available on request. Climax Molybdenum Company, 500 Fifth Avenue, New York City.

PRODUCERS OF FERRO-MOLYBDENUM, CALCIUM MOLYBDATE AND MOLYBDENUM TRIOXIDE

MOLY

Climax Mo-lyb-den-um Company

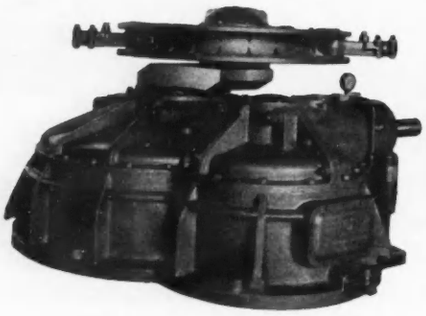


HD-80 Reduction Gear

in connection with single well pumping or to serve as a four-well pumping power. National disc cranks are available as well as concentric and plain cranks for back crank pumping.

▪ *Geared Power Type G-100*

A geared power with a design in which overhanging load is reduced to a minimum. The crank is forged integral with the rotating shaft. This shaft is mounted on widely spaced Timken bearings, with the load at the upper bearing carried by the heavy re-

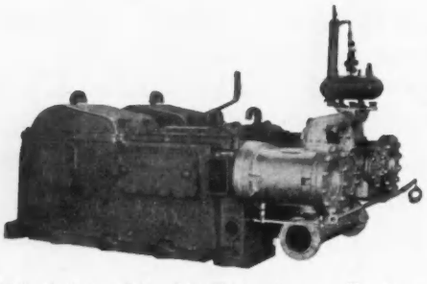


National Geared Power

inforced cover. This construction gives great strength and rigidity as well as desirable load distribution. A lubricating system effective under any weather conditions and operating speeds further contributes to lasting service and low maintenance. Nominal rated horsepower 91 at 20 strokes per minute. Stroke length is 36 inches.

▪ *Ideal-Ajax Twin Steam Engine*

A roller bearing twin steam 14x14 drilling engine that meets the requirements for drilling the deepest holes in the shortest time. It has ample power to operate the heaviest of present-day drilling equipment at maximum speeds. A number of late refinements and improvements are shown.



Ideal-Ajax 14 x 14 Twin Steam Engine

▪ *Type CA-30 Hook*

A new Ideal rotary hook of 300-ton capacity on which all load carrying parts are forged steel. It can be auto-

Left: Type CA-30 Hook
Right: Ideal Swivel

matically locked in four positions from the derrick floor. Swivel bearings are of the cone type, fully enclosed and alemite lubricated.

▪ *Ideal Swivels Types M and E*

Modern type swivels for present-day deep drilling that embody a number of features. Among the most important of these are said to be the Ideal "Precision Built" main bearings, made to give the utmost in main bearing performance and the automatically adjusted "V" packing for the wash pipe. The bail is of the preformed weldless type, forged from a solid steel billet, and the bail pins carry the load in double shear. Other notable features are: Automatic packing between housing and rotating sleeve; automatically induced oil circulation and a unitary assembly of sleeve; bearing and coupling that permits these parts to be removed as a unit without disturbing the adjustment of bearings or removing the coupling.

▪ *Ideal Type SC Crown Block*

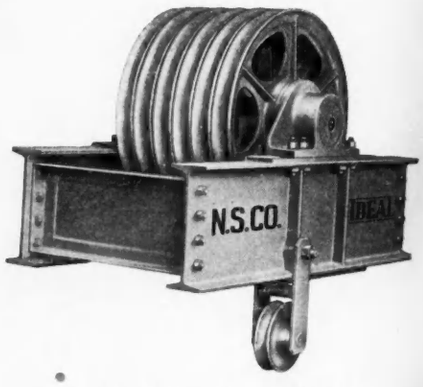
The Ideal Type SC crown block is of the double-deck construction and cross-over sheave type. It is built for

Ideal Type SC Crown Block

a safe working load of 350 tons and offers long life, and maximum speed and smoothness of operation.

▪ *Single-Shaft Type Crown Blocks*

A full line of Ideal single shaft type crown blocks for the complete range of rotary drilling are now available. Type

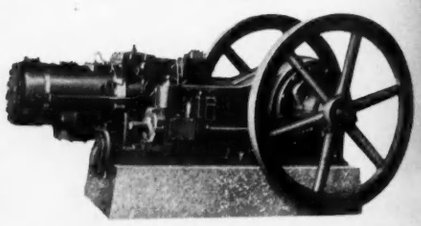


Single-Sheave Crown Block

536-L has five sheaves and a safe working load of 300,000 pounds. The largest size, Type 648-R, is shown also. This is a 6-sheave block with a safe working load of 350,000 pounds.

▪ *Type C Superior Gas Engine*

A horizontal 2-cycle gas engine made in 5 sizes with ratings of 25, 30, 40, 45 and 50 horsepower at 200 revolutions per minute. The regular maximum



Superior Type C Gas Engine

speed is 350 revolutions. Sizes shown are 40 and 45 horsepower. The Superior Type C Engine is a late and modern development of the horizontal

COMPLETELY PORTABLE

1,000 to 5,000 feet Drilling.

BUILT IN THREE SIZES
DELIVERY IN 10 DAYS

1,000 to 10,000 feet Servicing.

HOUSTON OCTOBER 11-16-1937
SEE OUR EXHIBIT
OIL WORLD EXPOSITION

SPECIAL FEATURES

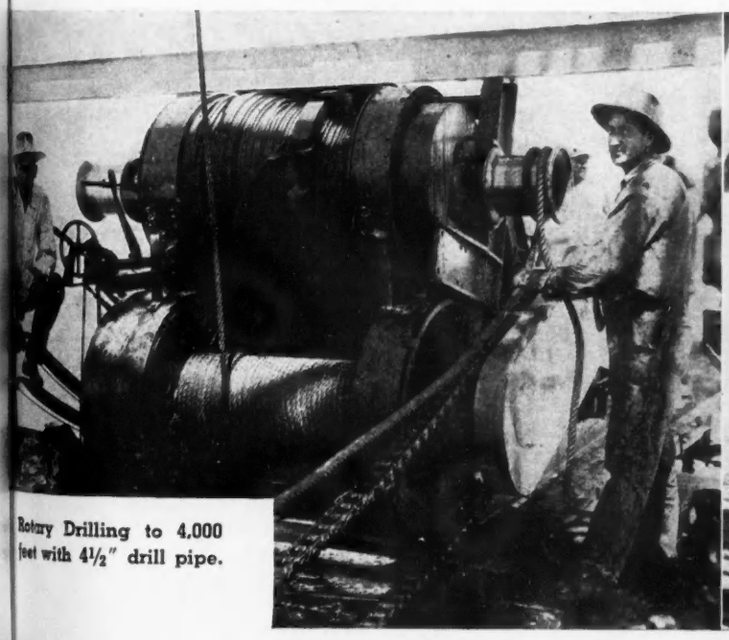
All wearing parts heat-treated.

Both drums friction driven from countershaft.

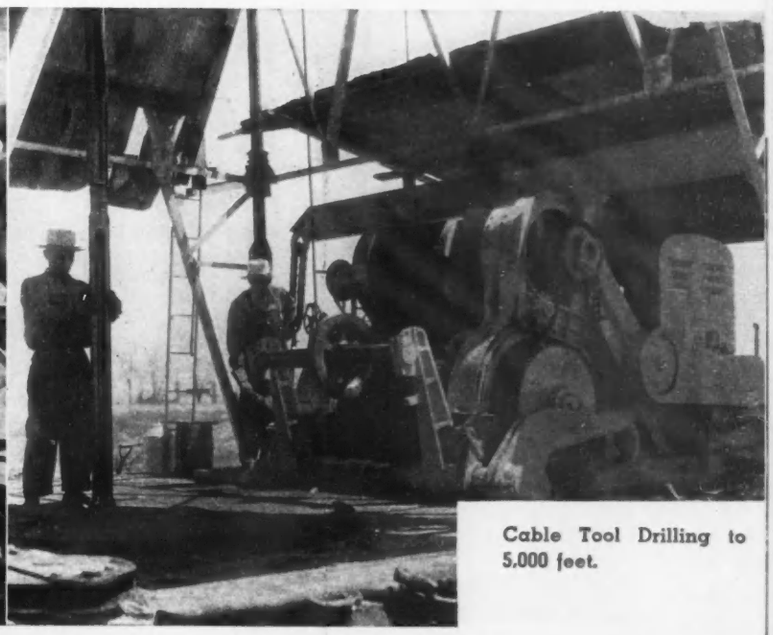
Both drums free rolling on Timken bearings. internally oiled.

WE HAVE IT!

A Convertible Unit for Rotary or Cable Tool Drilling and Rotary or Cable Tool Servicing. ONE machine to perform FOUR jobs.



Rotary Drilling to 4,000 feet with 4½" drill pipe.



Cable Tool Drilling to 5,000 feet.

ALLSTEEL PRODUCTS MFG. CO.
Wichita, Kansas, U. S. A.
801 So. Wichita St., P. O. Drawer 2001
Cable Address "ALLSTEEL" Phones L. D. 289, Local 4-4381—4-4382

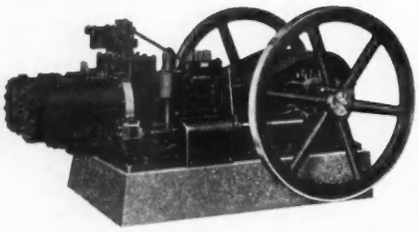
CARDWELL ALL STEEL
REG. U. S. TRADE MARK PAT. OFFICE
THIS TRADE MARK INSURES HIGHEST QUALITY AT LOWEST PRICE

Our Catalog is filed in the COMPOSITE CATALOG

gas engine for deep well pumping. Conversion from gas to oil fuel or vice versa can be made in the field at nominal expense.

▪ *Twin-Cylinder Horizontal Gas Engine*

The 120-horsepower Superior Type BT horizontal 2-cycle convertible gas engine is one of a line of four sizes of

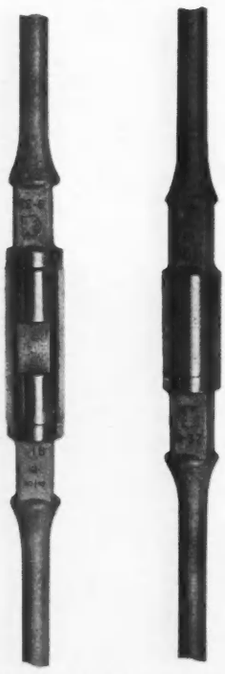


Superior Twin-Cylinder Horizontal Gas Engine

twin-cylinder gas engines. These are especially designed for driving powers, compressors, pumps, or for any other duty that is continuous and exacting. The engine embodies a number of new and improved features.

▪ *National Sucker and Pull Rods*

National sucker and pull rods are made in a complete range of sizes and types to cover the requirements of the



National Sucker Rods

oil country. Only materials properly heat-treated and of exceptional basic qualities are used. An extensive metallurgical and chemical laboratory is maintained and a careful check is constantly made to insure the required chemical and physical properties. The steps in upsetting the rods are shown in the exhibit in addition to the various types of rods.

▪ *Ideal FE-27½-B Rotary Machine*

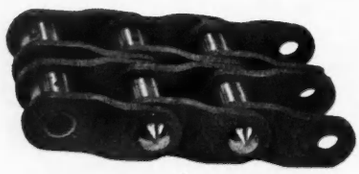
An extra heavy enclosed unit which embodies features resulting in a fast and true running machine for drilling the deepest wells. Generous use of alloy steel throughout insures safe and efficient operation under the most severe conditions.

▪ *National Tool Joints*

National rotary tool joints shown in a number of types and sizes are the result of years of manufacturing and field research. They are the product of a factory equipped with machinery of the very latest type designed expressly for tool joint manufacture.

▪ *Ideal Sprockets and Chain*

Ideal cut tooth sprockets used with Ideal rotary chains furnish a combination for installations where either speed and load requirements are excessively high. Ideal Type F-3125 3⅛-inch pitch

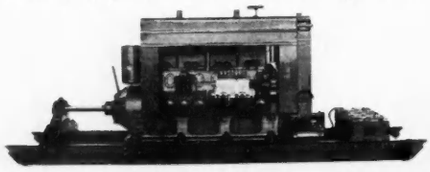


Double Strand Ideal Chain

A.P.I. roller chain is available. It is made in single and double strand, to high material and precision standards. In the double strand it has a much higher load and wearing capacity than No. 4 A.P.I. chain.

▪ *Vertical Diesel Engine*

The Superior Model A Diesel Engine is a vertical type with a usual speed range of 800 to 1400 revolutions per minute. It is made in 2, 4, 6 and 8-cylinder models, all with a 4½-inch bore and a 5¾-inch stroke. The engine is

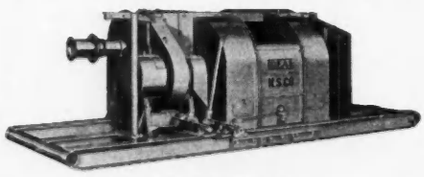


Superior Model A Diesel Vertical Engine

suited for any oil field service requiring an engine of its power and speed characteristics. It is convertible in the field to gas operation or can be equipped originally for gas fuel and later changed to Diesel operation.

▪ *Ideal Draw Works*

The Ideal No. 23-7½MB is a 2-shaft 3-speed unit type draw works designed

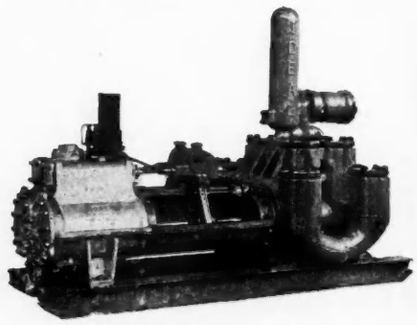


Ideal Draw Works

for average drilling conditions and designed for economy without sacrificing strength. Being of the low line shaft design, and using only 2 bearing supports, it is compact and rigid in construction. Notwithstanding its compactness, almost all the desirable features for drilling to moderate depths are available.

▪ *Type C*

The 14½-inch by 7½-inch by 18-inch Type C steam slush pump offers ample volume and pressure capacity for all ordinary deep drilling requirements. Its performance and reliability are a mat-



Type C Slush Pump

ter of record in all principal fields. A number of late improvements have been made, including an automatically lubricated, completely enclosed rock shaft stand.

▪ *Traveling Block*

The Ideal 76-inch traveling block is shown in the 5-sheave type. This is one of a line of blocks built in three sizes with sheave combinations from 3 to 6.

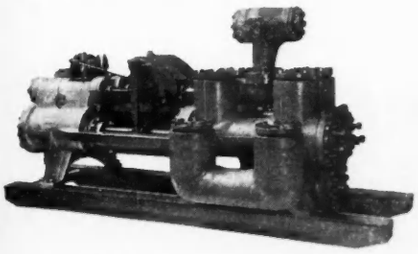
Ideal Traveling Block

Sheaves are manganese steel and are mounted on extra heavy roller bear-

ings. A patented built-in guard eliminates all dangerous projections.

▪ ***Steam Slush Pump***

The Ideal 15½-inch by 8½-inch by 20-inch steam slush pump is made for the most severe requirements of deep



Ideal 15½ x 8½ Slush Pump

drilling. The rock shaft stand is enclosed in an oil-tight case and is automatically lubricated. The steam end is unusually efficient and economical in the use of steam. Maximum recommended working pressure of the fluid end is 2500 pounds.

Buckeye Traction Ditcher Company

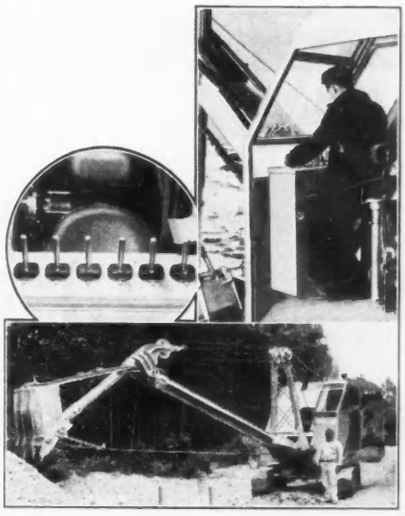
▪ ***Ditching Machines***

The featured display of Buckeye Traction Ditcher Company, Findlay, Ohio, is its latest design in big pipe line ditchers, the new Model 49 Buckeye. Cutting widths of this new ditcher range from 22 to 40 inches, with depths to 8½ feet. Transmission drives for all operations eliminate the older type of open drive, making the most efficient use of power and simplifying the servicing of the machine. All transmissions have heat treated out-gears, in oil tight cases.

For all its rugged strength and power and despite the size of trench it digs, this new Buckeye is handled with remarkable ease, the manufacturer claims.

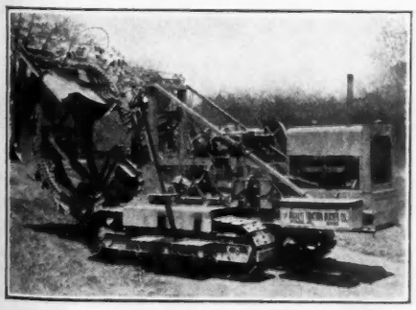
In contrast to the size of the big ditcher, the Buckeye Model 12 Utility Ditcher displayed looks like a midget. But on the jobs that come within its range of trench width and depth—14½ to 24 inches wide and to 5½ feet deep—this fast little ditcher is a giant in ability, the company states.

The other new machine being displayed by Buckeye is the new Clipper—a convertible excavator that may be had equipped for shovel, dragline, crane, clamshell or trench hoe work. A



Buckeye Clipper

feature of this machine that is attracting a great deal of attention is the new Metered Vacuum Control, with all operations individually controlled by easy working valve levers that respond to a light touch of the fingers. The Buckeye Clipper is built in ½, ⅝, and ¾-yard sizes.



Buckeye Model 12 Utility Ditcher

Alten's Foundry & Machine Works

▪ ***Flexible Stuffing Boxes***

Alten's Foundry & Machine Works, West Wheeling Street, Lancaster, Ohio, is exhibiting its new type flexible stuffing box.

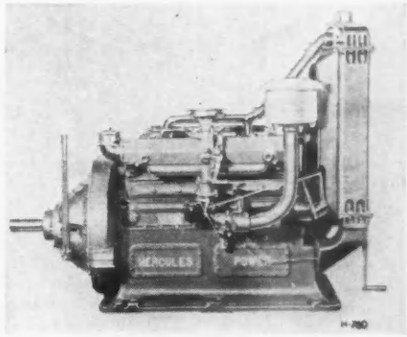
This box is fitted with a flexible coupling which allows the stuffing box to give with the movement of the polished rod, thereby eliminating wear on both the polished rod and stuffing box. The dustproof oil reservoir provides means for proper lubrication of the polished rod. It can be furnished with adaptor nipple as illustrated, or with pumping tee.

Alten's Flexible Stuffing Box

Hercules Motors Corporation

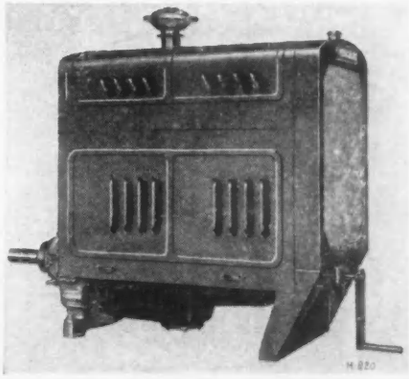
▪ ***Power Units***

Hercules Motors Corporation, Canton, Ohio, is exhibiting its complete line of heavy-duty, industrial power units arranged for operation on gasoline, natural gas, kerosene and also, its modern, heavy-duty, four and six-cylinder Diesel units.



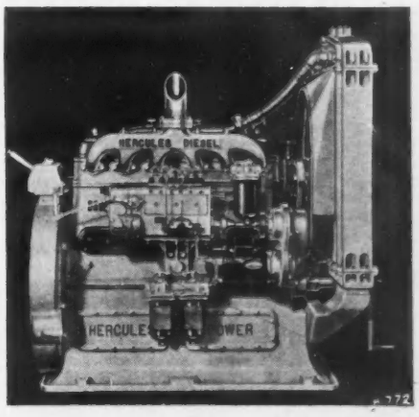
Hercules RXB Diesel Unit

Of considerable interest is the actual operation of several Diesel and natural gas units at the show, and the visitors will have an opportunity to see the new



Hercules HXB Closed Type Six-Cylinder Diesel Unit

"Dooc" 4x4½ inches, four-cylinder Diesel unit which is on display for the first time. This unit develops 65 corrected horsepower at its maximum



Hercules DRXB Six-Cylinder Open Type Diesel Unit

Complete OIL FIELD

Super Service Oil Field Chain

Simplicity . . Dependability
Long Life

Staggered assembly for balance at high speed. Cottered construction (patent) for ease of assembly and disassembly in the field—yet, with this construction, all the rigidity of a riveted chain.

Alloy steels, accurate machining and grinding, special heat treatments, all to produce low ultimate cost per foot of hole drilled.

SEE THIS CHAIN AT THE HOUSTON SHOW

BALDWIN-DUCKWORTH

Factories at SPRINGFIELD

Factory Representative: **Geo. J. Fix, Dallas, Texas**

BALD

ask the Drille

DCHAIN *Service!*

Triple Drive Chain for Diesels

Diesel rigs raise power transmission problems which are being most successfully handled by Baldwin multiple strand roller chains.

These chains, such as the 1½" pitch triple chain here illustrated, have the enormous tensile strength necessary to handle the overloads and shocks incident to this service.

In addition, their construction—shorter pitch—gives the flexibility necessary to insure high speed operation.

THIS CHAIN ON EXHIBIT AT THE HOUSTON SHOW

CHAIN CORPORATION

and WORCESTER, MASS.

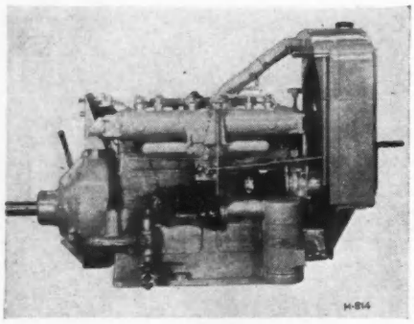
Export Department: Oil Industries Appliances Co., 39 Cortlandt St., New York City

WIN

...He Knows

speed of 2600 revolutions per minute. The maximum speed for continuous service is 1800 revolutions. Included in this line is the "Doob", a 3¾x4½ inches, four cylinder unit which will develop 57 corrected horsepower at the maximum speed of 2600 revolutions.

Other units of interest to the field operators are the "JXC" low fire hazard unit, the "RXB" low fire hazard unit and the "HXB" special closed type power unit, all which are arranged for oil field applications. The low fire hazard units are equipped with water cooled exhaust manifolds, special protection ignition systems, gas valves,



Hercules GXC Six-Cylinder Diesel Unit

heavy-duty oil type air cleaners, telegraph controls, heavy-duty clutch power take-off assemblies, base type oil pans with large oil sump capacities and heavy-duty radiators.

The exhibit includes the "DHXB" 5x6 inches, six cylinder unit, the "DRXB" 4⅜x5¼ inches, six cylinder unit and the "DJXC" 3¾x4½ inches, six cylinder Diesel unit.

A. O. Smith Corporation

Smith high-yield casing and Smith line pipe are featured in the exhibit of A. O. Smith Corporation of Milwaukee, Wisconsin. A condensed description of these products follows:

▪ *Smith High Yield Casing*

Developed primarily to meet the problems of deep well operation, Smith high-yield casing is produced by a new process in which actual compression of the pipe raises the compression yield point of the steel in the circumferential direction. At the same time, the tension yield strength of the casing in the longitudinal direction and the tension yield strength of the coupling in the transverse direction are both raised so that greater pull-out strength is obtained. The procedure is to manufacture casing which has a larger circumference and a thinner wall than desired in the finished casing—then compress to the predetermined diameter and wall thickness. It is made in sizes from 4¾ inches to 24½ inches O.D.

Smith high-yield casing, it is pointed out by the manufacturer, can be utilized in any one of three ways to effect economies:

(1) By using a lighter weight casing at a specified setting depth, if it is desired to maintain the present safety factor for collapse; (2) to increase the safety factor at the specified depth without increasing weight; (3) to allow greater setting depths with equal safety, thus meeting the trend toward deeper walls.

▪ *Smith Line Pipe*

Smith line pipe is formed from flat steel, so that wall thickness can be accurately controlled. After manufacture, each length of pipe is expanded by internal hydraulic pressure into a cylindrical die. This procedure is said to produce pipe more accurate in diameter and roundness—and at the same time test the weld. Thus the strength of Smith line pipe is definitely known, just as the safety factor in Smith pressure vessels is definitely known, and the amount of steel required for any given working pressure can be accurately and readily determined. Made in sizes from 8⅝ inches to 26 inches O.D.

Southern Engine & Pump Company

Southern Engine & Pump Company, Houston, Texas, has on exhibition in Booths 102, 200 and 201 a number of Southern units and equipment it represents, as follows:

▪ *Viking Truck Units*

Viking Truck Mounting Units used in connection with seismograph exploration work and for delivering oils and gasoline from tank trucks.

▪ *Pomona Pumps*

Pomona Deep Well Turbine Pumps, showing how the water is delivered from water wells.

▪ *Pumping Units*

Southern Pumping Units consisting of natural gas engine and rotary pump used for pick-up pumps in oil fields and for water service supply for drilling rigs.

▪ *Rig Lighter*

Southern Rig Lighter consisting of gasoline or natural gas engines direct connected to generator for lighting drilling rigs.

▪ *Bug Blower*

Southern Bug Blower manufactured for the protection of the drilling crews.

▪ *Goulds Pumps*

Goulds multi-stage centrifugal high-pressure main line pump.

Goulds double-action horizontally split case general service centrifugal pump.

▪ *Unloading Pump*

Viking twin bulk station unloading pumping unit.

▪ *Enterprise Generating Unit*

Also on exhibit by Southern Engine & Pump Company is an Enterprise heavy-duty full-Diesel engine driven generating unit.

Everlasting Valve Company

▪ *Valves*

As a leader, Everlasting Valve Company, Jersey City, New Jersey, exhibiting with W-K-M Company, is showing its Figure 1010-350, a rotating disc valve with cast steel body and rack and pinion control. The valve carries a disc with Stellite face. It is of special design for high pressure boilers in the drilling fields where the steam pressure ranges up to 350 pounds. There is also a display of Figure 1010-300, for boilers serving at pressure not greater than 300 pounds; and the original Everlasting valve, Figure 1000, straight lever type, for pressures up to 250 pounds.

Another special feature on display is the Everlasting Emergency Throttle Shut-Off valve, arranged to demonstrate an installation on a drilling rig, where the valve is installed as an insurance against damage to property or life. The valve is sold only in cast steel construction, straight lever type. It also is the rotating disc construction, carrying discs of stainless steel.

Everlasting 350-Pounds Pressure Valve

The Everlasting Duplex Blow-Off Unit, an arrangement of two boiler blow-off valves as required by the A. S. M. E. Boiler Construction Code, is being shown. Everlasting special water column connection valve is arranged with bracket and look device so that it also meets code requirements. In the Everlasting valves of today, there are two springs of Inconel wire. They are rust resistant and almost equal to steel springs.

Carlyle Rubber Company

▪ *Formation Tester Packer*

Carlyle Rubber Company, New York City, is exhibiting rat hole formation tester packer elements, for use on rat hole formation testers. Formerly replacement packer elements for these tools had to be made by field men or in field shops from belting and similar material, a rough and tedious operation that caused frequent delays and trouble. These elements are made in all sizes and shapes, and are offered in three different styles.

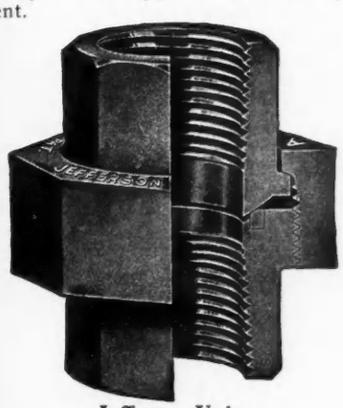
Norvell-Wilder Supply Company

Norvell-Wilder Supply Company is exhibiting in the following booths at the Oil-World Exposition: 104, 106, 108, 110, 112, 114, 116, 118, 120, 205, 207, 209, 211, 213, 215, 217, 219, 221.

The products of the following manufacturers are being demonstrated: Jefferson Union Company, The Kennedy Valve Manufacturing Company; A. Leschen & Sons Rope Company, Coffing Hoist Company, Western Block Company, Dean Brothers Company, Baash-Ross Tool Company, Production Equipment Company, Quigley Company, Inc., and Hewitt Rubber Company.

▪ *Jefferson Unions*

These unions, made by Jefferson Union Company, are manufactured under exacting metallurgical specifications, accurately machined, and rigidly inspected in order to meet, with a wide margin of safety, the demands for high quality in this type of oil field equipment.



Jefferson Union

Jefferson unions and flange unions are made of air refined malleable iron of an average tensile strength running from 54,000 pounds to 56,000 pounds per square inch.

▪ *Coffing Hoists*

Among the products of Coffing Hoist Company on display is the new model RGL ratchet gravity lowering hoist, 2-4-6 ton convertible. The outstanding features are: Ratchet lever hoist; load lowered by gravity; free chain; ball bearing; governor for controlling lowering speed; stop load in any position; will lift 100 percent over rated capacity.

This Coffing hoist is particularly adapted for raising and lowering pipe. Permits taking a steady pull and allows steady gravity lowering. Very desirable for pipe line work, especially reconditioning.

▪ *Dean Brothers Pumps*

Dean Brothers Company pumps are being shown. Among them is the heavy-pressure piston pump for heavy duty. It has bolted in liners, two-piece steel piston rods, and is especially recommended for high pressure boiler feeding and line service.

Another Dean pump being shown is the Durable duplex side pot pump of 600 pounds pressure, and the duplex power pump, which is of the side pot type for heavy duty. Other combination units are on exhibit.

▪ *Anvil Brand Blocks*

A full line of Anvil Brand blocks, manufactured by Western Block Company, are being demonstrated. Among them are the Perfect Metal blocks,

Anvil Brand Block

which are distinguished by: malleable iron shells, colored red edges rounded to protect rope, and extra heavy hooks. They are made in sizes for manila rope from ⅜ inches to 1⅝ inches in diameter.

Coffing Hoist

▪ *Hewitt Belting and Hose*

Norwild belting and rotary hose, manufactured by Hewitt Rubber Company are on display.

The Norwild oil well belting is super-flexible, folded edge type friction surface belt, specially designed for drilling and pumping service. Made from balanced, close woven, heavy weight duck of great strength and with minimum stretch. The highest grade friction used throughout with an extra skim coast of friction between every ply, which is said to insure long flexible life, waterproof quality and increased ply adhesion. Made in all sizes and plies.

Super-Norwild Rotary Hose

The Super-Norwild rotary hose is designed for high pressure and deep well drilling. The extra thick tube is very resistant to abrasion and oil, which is bonded to the duck plies by an extra ply of open weave fabric. There is a heavy duct reinforcement of heavy balance weave, high tensile duck—insuring high bursting pressure. Two plies of high carbon steel braided wire is embedded in the rubber and applied over the duck in alternate directions. Two additional plies of the above heavy duck and thick, tough rubber cover are applied over the wire for protection against abrasion.

▪ *Other Hewitt Products*

Sectional specimens on display also display the features of: Maltese cross rubber covered fire hose; Monarch steam hose; Stuffing box rings; high pressure and super-heat steam packing; valve stem packings; hydraulic packing and asbestos sheet packing.

▪ *Fluid Seal Pumps*

Fluid Seal pumps, manufactured by Production Equipment Company, have chromium surfaced tubes which gives them anti-friction bearing surfaces and prevents galling. The bumper nuts of the unit pull type pumps are heat treated to file hardness to prevent burring with wrenches with consequent scoring of barrel. These pumps are manufactured from high grade seamless steel tubing. The removable and rigid types, with a few exceptions, are interchangeable. There is a full sealing surface on both the inside and outside diameters of the stand tube. A straight central fluid course reduces the possibilities of the fluid becoming emulsified through the churning back and forth through ports, it is claimed. The removable type is withdrawn with the

rods, and the rigid type standing tube is screwed on a standing valve shoe and run with the tubing.

▪ *Quigley Furnace Specialties*

The safety and trouble saving features of furnace specialities manufactured by Quigley Company are being demonstrated. It is the intention of the Quigley Company officials to make the abstract principles involved easily understood.

▪ *Other Norvell-Wilder Products*

Demonstrated also in the Norvell-Wilder Supply Company section are the products of: The Kennedy Valve Manufacturing Company; A. Leschen & Sons Rope Company, and Baash-Ross Tool Company. Descriptions of the products of these companies are given under their respective headings elsewhere in this section of THE OIL WEEKLY.

Lane Wells Company

▪ *Gun Perforator Service*

A completely-equipped Gun Perforator Service Truck, in charge of a Lane-Wells, "Shooter," is on display on Lane-Wells' outside lot 1003.

Lane-Wells Gun Perforator

At the inside Booths, 645 and 647, moving pictures of gun perforator field operations are being shown, and a life-size model of the gun itself will be on display, arranged so that pressing the firing switch on a standard control panel illuminates each gun-chamber in turn.

▪ *Multiple Ring Packers*

Lane-Wells "Multiple Ring" Type Packers are shown, emphasizing the construction principles that prevent sticking to the casing; Five packing rings, consisting of multiple layers of heavy, graphite-impregnated, bias-cut fabric moulded over a one-piece rubber core. The layers of fabric prevent vulcanization to casing, and the rubber core assures elasticity to draw rings away from casing when packer is released. These rings are expanded to packing-off position by metal expansion rings that seat on each other with tapered seats, preventing over-expansion of packing rings or damage to casing, protecting packer body from external pressure, and allowing fluid or gas to be trapped between the packing rings.

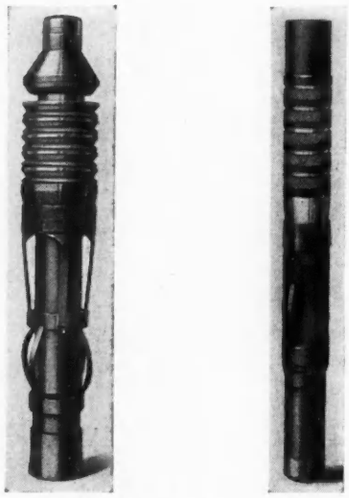
▪ *Liner Hangers*

Lane-Wells Company also is exhibiting Liner Hangers, which are recommended for preventing sagging and collapse of liners over 100 feet in length.

These Liner Hangers are regularly furnished in three packing and one plain type and make use of the same

Lane-Wells Gun Perforator Truck

"ring" features that characterize Lane-Wells Packers.



Left: Lane-Wells Ring Packer
Right: Liner Hanger

Shown is a Thin-Wall Packer Type Liner Hanger, a slight variation of the "ring" principle, used where clearance between liner and inside of casing is very limited.

Lead packer types and plain types are also available, in all convenient sizes.

A setting and re-setting tool is furnished with each type of Liner Hanger, assuring efficient setting.

▪ *Anderson Surveys and Directional Control*

Lane-Wells' Alexander Anderson Division will be represented by interesting moving pictures of field operations, (alternating with the Gun Perforator film), and by various models of the Anderson Instruments and Services, which include:

Photo-Record Magnetic Single-Shot Surveys; Photo-Record Go-Devil Surveys; Standard Oriented Surveys; Standard Magnetic Surveys; and for Directional Control, a combination of survey methods with the Kinzbach Whipstock and Lewis Knuckle Joint.

▪ *Bridging Plug*

Lane-Wells Company also is displaying its Bridging Plug, which is run in on the same type cable, subject to the same electrical controls, as the Gun Perforator.

The plug has a packing sleeve made of Duprene, a material practically impervious to deteriorating effects of oil

Left to right: Anderson Photo-Record Magnetic Single Shot Survey Instrument; Lewis Knuckle Joint; Kinbach Whipstock.

and gas. This sleeve is automatically expanded against the casing and is provided with lips on both ends that cause fluid or gas pressure to further tighten the pack-off.

When the plug has been lowered to the desired depth, the operator presses an electric switch, thus detonating a small charge of powder in the plug. This breaks a frangible link, causing the two-way slips to set and releasing cable head from plug.

Darling Valve & Manufacturing Company

▪ *Valves*

Darling Valve and Manufacturing Company, Williamsport, Pennsylvania, is showing a line of cast steel taper seat gate valves of an improved design. One of these valves is equipped with a motor and an electric unit for remote control.

Also included in the display are forged steel double disc gate valves for drilling through and flow line service, Darval semi-steel double disc gate valves and check valves for cross country pipe lines and gathering lines and a quality line of "All Bronze" gate valves. Several of the valves are cut away to show the internal construction and action of the parts as the valves are operated.

▪ *Fire Hydrant*

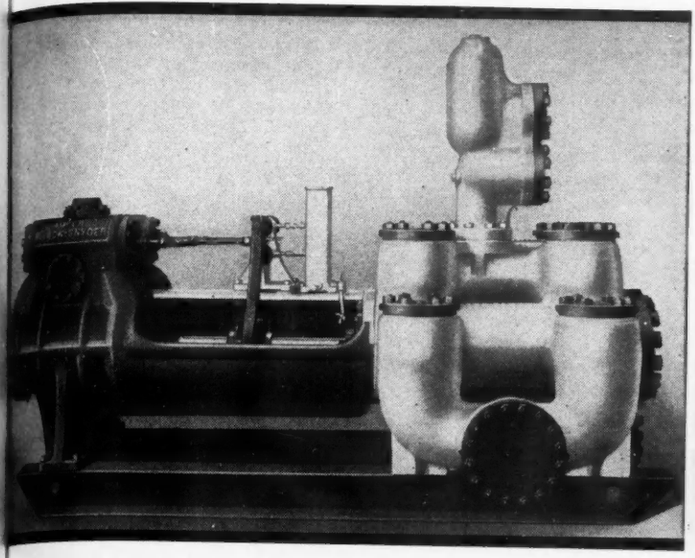
A Darling fire hydrant for use in high pressure fire service lines at industrial plants is also shown.

▪ *Darcova Valve Cups*

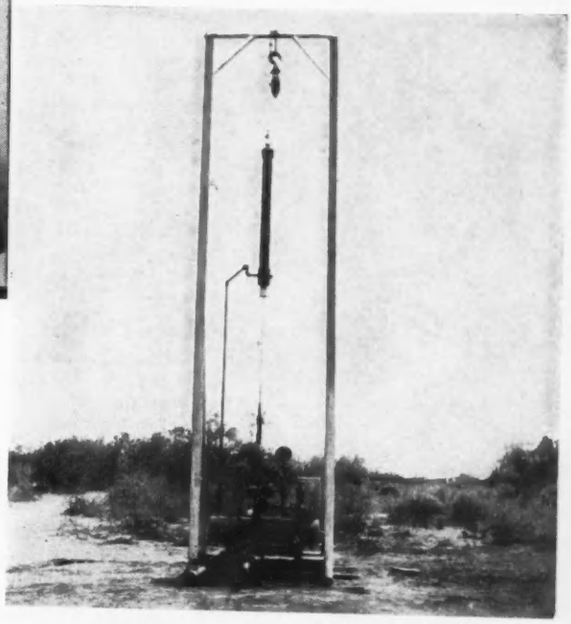
There is an interesting display of Darcova valve cups (the original composition cup). In addition Darval and Darflex composition valve cups and Darling balls and seats are shown.

Part of the WILSON SUPPLY CO. *FAMILY*

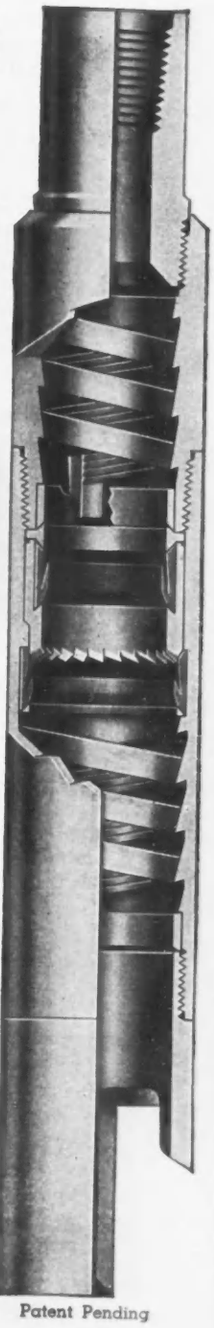
of internationally famous oil field equipment, for which we are exclusive Gulf Coast Distributors. You're invited to make our booths your Oil-World Exposition headquarters.



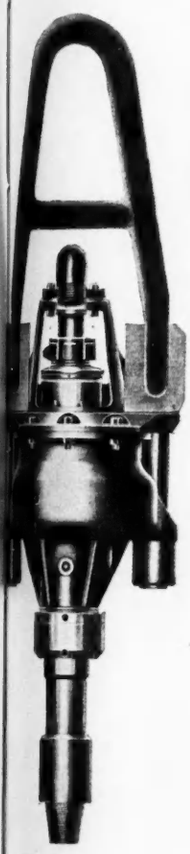
WILSON-SNYDER PUMPS



NIXON Surface Control
Gas-Lift System



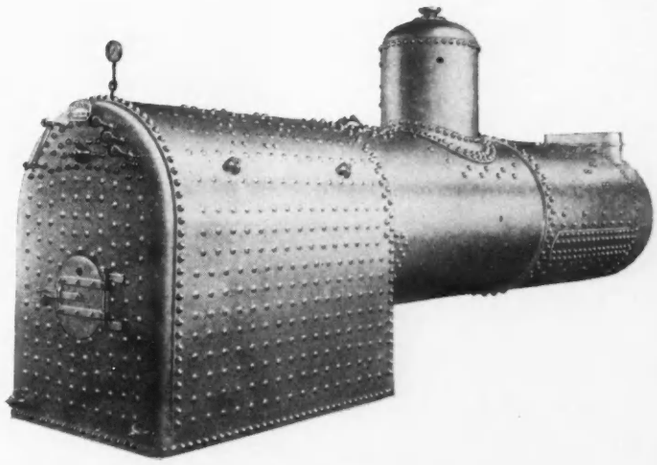
Patent Pending
BOWEN
OVERSHOT



GRAY
SWIVEL

AMERICAN CABLE
Tru-lay *Pre*formed Wire Rope

SIEVERS REAMER



KEWANEE BOILERS

WILSON SUPPLY CO.

1412 MAURY ST., HOUSTON, TEXAS

Exclusive Gulf Coast Distributors for: Wilson-Snyder Pumps; American Cable Tru-Lay Pre-formed Wire Rope; Kewanee Boilers; Sievers Reamers; Drift Meter Jr.; Gray Swivel; Nixon-Ferrill Gas Lift; Nixon True-Taper Slip and Spider; Bowen Pack-Off and Releasing Drill Pipe Overshot; Douglas Weight Indicator

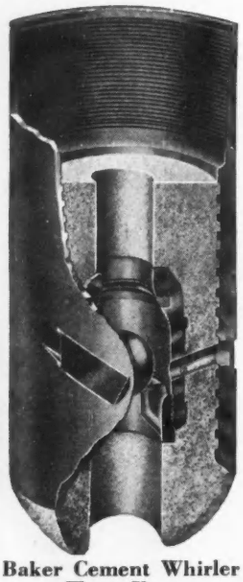
OIL AND GAS WELL SUPPLIES

Branch Stores — Barbers Hill, Kilgore, Gladewater, Talco, Bay City, Victoria, Pierce, and Corpus Christi, Texas. Lake Charles, New Iberia and Rodessa, Louisiana.

Sales Offices—Tulsa, Oklahoma; Dallas, Texas; Shreveport, La.

Baker Oil Tools, Inc.

Baker Oil Tools, Inc., Huntington Park, California, is displaying practically the entire Baker line in Booths 100 to 103, the familiar blue and yellow colors being conspicuous in the booth

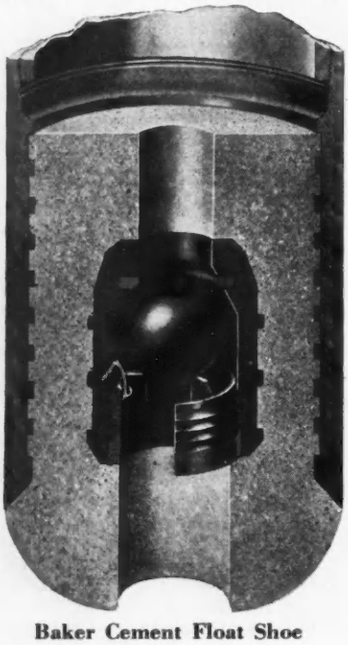


Baker Cement Whirler Float Shoe

scheme. A complete description of this company's display follows:

▪ *Cement Float Shoe*

This unit of landing and cementing equipment will safely guide and float-in the longest and heaviest strings of casing, the manufacturer states. It is designed with a ball valve which instantly double-seals against a narrow tough rubber seal (backed by Bakelite) at the slightest reversal of pressure. Valve chamber is sufficiently large to permit unrestricted passage of fluid yet small enough to give the necessary wash down action. No metal ever is used in the internal construction of Baker floating units, only Baker formula concrete and a minimum amount of Bakelite being used. Both materials quickly and easily drill up and circulate out of the hole.



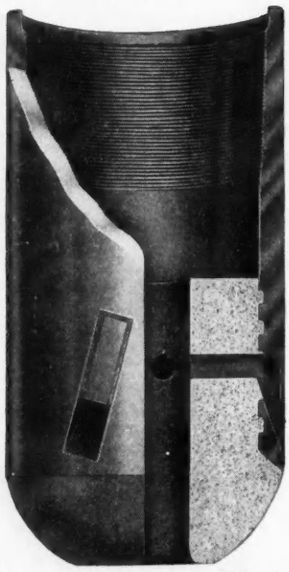
Baker Cement Float Shoe

▪ *Whirler Float Shoe*

The Baker Cement Whirler Float Shoe affords the ultimate in cementing efficiency, the manufacturer claims. In addition to the regular bottom circulating hole, it is designed with a number of baffled side ports leading out of the valve chamber below the valve seat. The cement slurry is thus directed in a whirling mass up and around the shoe and casing, resulting in the best possible chance for complete encasement of the pipe with a uniform body of cement and greatly reducing the danger of channelling. While primarily a cementing shoe, this unit is also a strong safe guide and float shoe, possessing the three Baker features of strength, valve efficiency and drillability.

▪ *Down-Whirler Guide Shoe*

This new shoe is designed to facilitate the landing of casing where bridges or other formation obstructions are encountered.

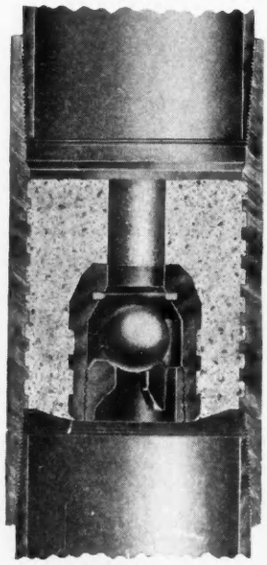


Baker Cement Down-Whirler Guide Shoe

As shown in the accompanying illustration, the Baker Cement Down-Whirler Guide Shoe is provided with a number of baffled side ports which are positioned downwardly a few degrees of vertical. Thus, when running in, if the casing encounters a sand bridge, the circulating fluid, as it passes through these baffled ports, is given a downward jetting and whirling action which cuts away the sides of the bridge, permitting it to be readily circulated out of the hole as disintegration progresses. The "Down-Whirler principal is also available in the Baker Cement Down-Whirler Float Shoe.

▪ *Cement Float Collar*

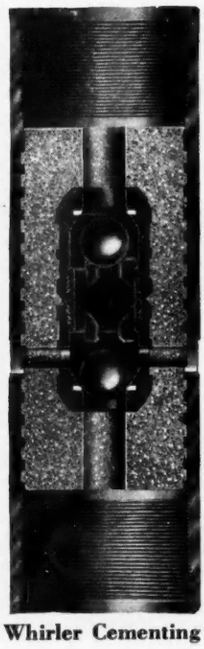
Many operators, when setting casing, prefer to have the principal "float valve" in a collar positioned one or two joints from bottom. The Baker Regular Cement Float Collar provides this feature. It not only relieves the strain on casing and equipment, but affords added safety against irreparable damage in case the pipe is accidentally dropped, it is stated. This Float Collar also serves as a "stop" for the plugs used in cementing thus retaining cement "tailings" inside the casing and insuring a better consistency of cement outside the shoe and casing. The internal construction of this float collar is like that of the Baker Cement Float Shoe, embodying the three Baker features of strength, valve efficiency and drillability.



Baker Regular Cement Float Collar

▪ *Whirler Cementing Collar*

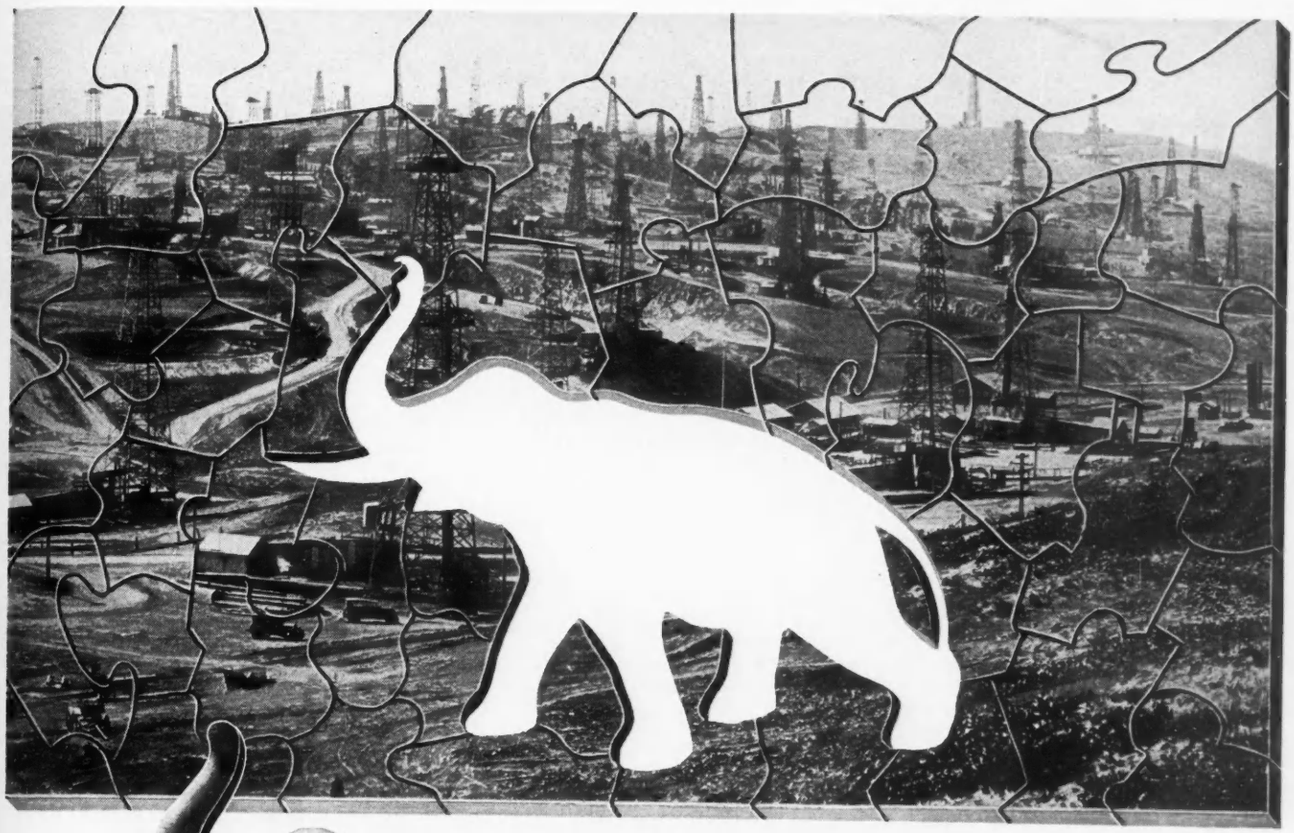
This collar provides an efficient economical method of cementing at any depth in the casing. Like the cement

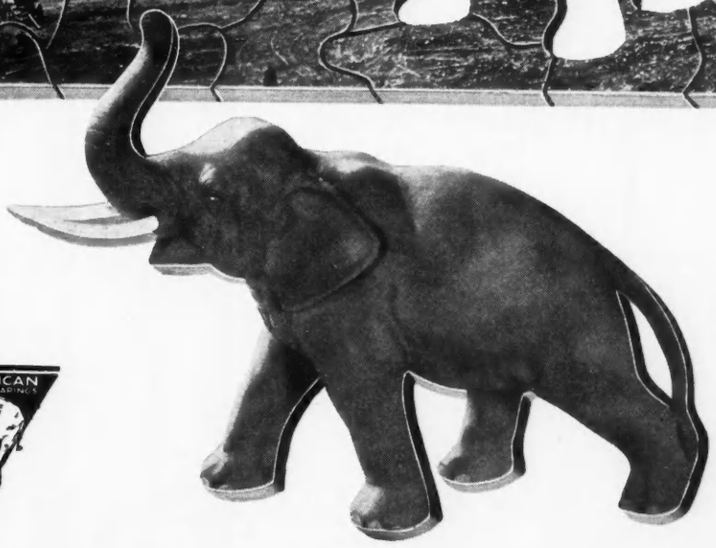


Baker Whirler Cementing Collar

"AMERICANS" . . .

fit the picture best!





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AMERICAN *HEAVY DUTY ROLLER BEARINGS*

whirler float shoe, it is designed with a number of baffled side ports which give an upward whirling motion to the cement, assuring better distribution with far less danger of channelling. The Baker Whirler Cementing Collar is particularly adaptable for cementing a combination string, where the upper portion is used as a water string and the lower portion as an oil string.

As shown in the illustration, this unit is designed with a double-sealing Bakelite Valve providing the three Baker features. The whirler collar usually is used in conjunction with the Baker Metal "Petal" Basket which is described below.

▪ *Metal "Petal" Basket*

During cementing operations, this Basket protects the formation below the cement job from cement contamination and from sloughings or cavings and also prevents any dissipation of the cement as it leaves the casing. The basket itself is made of a number of individual flexible brass leaves or "petals" each overlapping the other so that when in a fully expanded position, the upper portion of the basket packs off securely against the wall of the hole and forms a fluid tight seal between the fluid above and the formation below. The Metal "Petal" Basket with ring represents another practical arrangement of this efficient cementing basket. The individual flexible brass petals are affixed to a ring having a diameter slightly less than the coupling of the casing on which the basket is to be run. Under this set-up it is only necessary to weld the ring on the casing or nipple and the basket is ready to run.

▪ *Cement Retainer*

This tool solves many usual and unusual cementing problems by providing a sure, safe means of placing cement, under pressure, through tubing or drill pipe at the point where it will be most effective. It eliminates the danger of stuck or plugged tubing or drill pipe with the "tubing method" of cementing and is particularly suitable for cementing when circulation is difficult or impossible to obtain, the manufacturer states. The cement retainer is also used as a bridge plug in casing or liner and when set as such, packs off securely to prevent movement of liquid or gas either up or down the hole. Important applications for the cement retainer include: squeeze jobs, recementing, cementing behind sections of pipe, series cementing, plugging off bottom fluids, plugging back to upper zones, testing upper cased formations and as a heaving plug.

▪ *Hydraulic Wall Scraper*

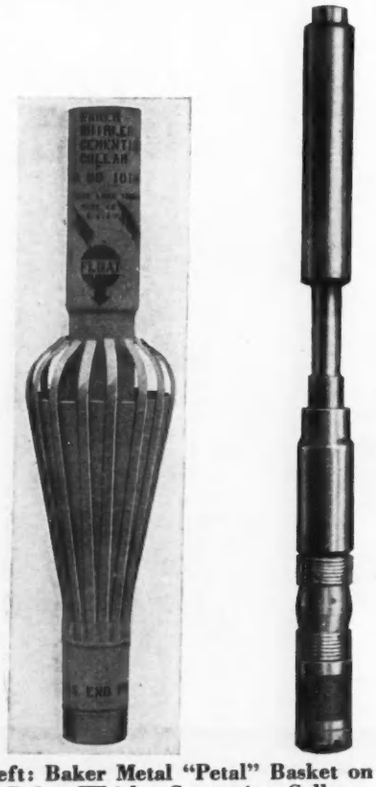
The Baker Wall Scraper provides a means of enlarging the walls of an open hole to a diameter considerably greater than that of the casing or hole through which the tool is run, and this enlargement may be performed at any desired point. The safety of construction and operation, combined with the reaming capacity of the Baker Wall Scraper, enables it to perform jobs heretofore considered impossible, the manufacturer states. Important uses include: removing mud from surface of oil sands, enlarging the hole for setting casing and liners, bottlenecking for cement jobs, straightening crooked holes, fishing jobs and water shut-off tests.

▪ *Wall Sampler*

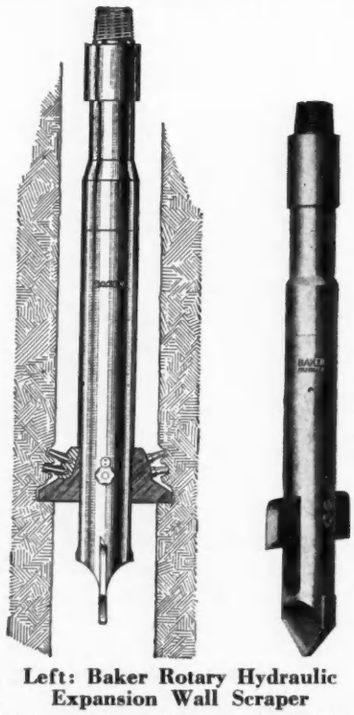
This device will take samples or cores from the walls of an open hole at any point desired. It restores records when cores are lost and sample formations which were not cored when drilled through. The wall sampler consists of a Baker wall scraper body with a set of special sampler blades mounted in place of the scraper blades. Each sampler blade has two core-taking tubes screwed into the upper section of the flat outer edge. The blades do not have a cutting edge but serve only to guide the core-taking tubes into the formation and to take the strain off the tubes as they are forced into the walls of the hole.

▪ *Drill Pipe Float*

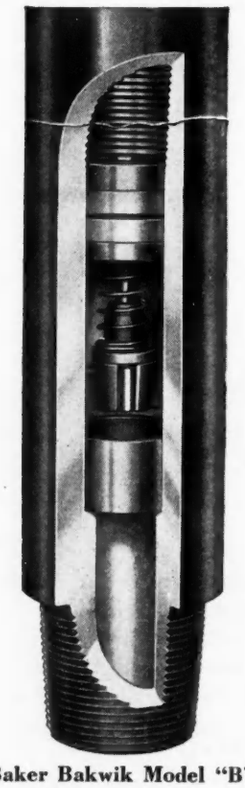
The new Model "B" Drill Pipe Float has a valve assembly constructed entirely without threads, the assembly being merely dropped into place in the "float joint" or body, without the aid of wrenches or special tools. When an unrestricted passage through the float joint body is desired, the valve assembly is quickly and easily lifted out by hand. Increased efficiency is one of the outstanding features claimed for the New Model "B" Bakwik Valve Assembly. Positive and instantaneous sealing is assured by the use of three rubber seals, two side rubbers and one valve seal. The valve seal is recessed in the face of the machined and ground conical valve and when fluid or gas back pressure causes the valve to close, this rubber seal creates a positive leak-



Left: Baker Metal "Petal" Basket on Baker Whirler Cementing Collar
Right: Baker Cement Regulator



Left: Baker Rotary Hydraulic Expansion Wall Scraper
Right: Baker Wall Sampler Taking Cores from side walls of hole



Baker Bakwik Model "B" Drill Pipe Float

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MANY of the leading producing companies and drilling contractors of the Gulf Coast territory consider our stocks as their dependable and economical source of supply on all types of oil country equipment, NEW or RENEWED, such as Drawworks, Pumps, Traveling Blocks, Swivels, Crown Blocks, Rotaries, Tool Joints, Spiders, Valves, Elevators, Tongs . . . and many other items, all made by nationally known manufacturers. They know that these products are guaranteed to be in first class condition . . . and they know the meaning of our guarantee. Too, they know the time saving involved in our immediate deliveries from complete stocks.

An important feature of our business is the **rental service** on all types of equipment. We specialize in the rental of Automatic Slip Type Elevators and Spiders for setting of long strings of casing.

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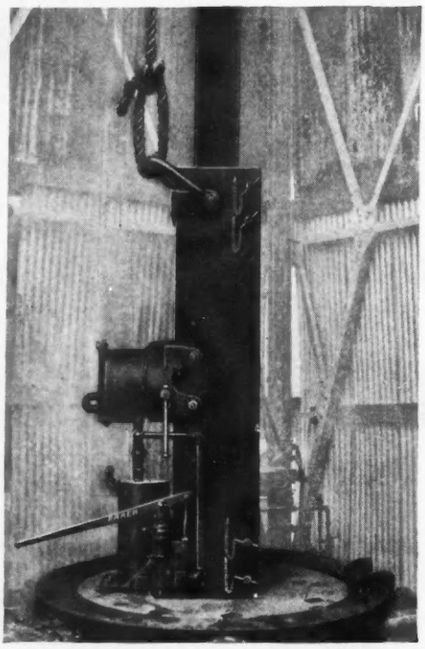
proof seal between the valve and valve seat. The new Model "B" Bakwik valve assembly can be used in both straight bore and bored-out bodies. It cannot, however, be used in those bored out bodies that have been re-cut to the point that insufficient contact remains between the inside of the float joint body and the side rubber seals of the valve assembly.

▪ *Hydraulic Kelly and Pipe Straightener*

The Baker Kelly Straightener is an efficient and easily operated device that utilizes the principle of the hydraulic



Baker Portable Hydraulic Kelly and Pipe Straightener

ram, applying the force built up by a manually operated pump to the bend in the kelly, drill collar or drill pipe, as it hangs suspended in the derrick. The unit is completely portable, weighing only 1200 pounds. The portability and ease of operation makes the straightener an economical and efficient tool to use in accessible areas. In foreign or isolated fields, however, it is considered absolutely indispensable, the manufacturer claims. By the addition of a simple, easily installed attachment that has recently been developed, it is now possible to adapt the kelly straightener to efficient horizontal pipe straightening work.

Crouse-Hinds Company

▪ *Condulets*

Crouse-Hinds Company, Syracuse, New York, is exhibiting condulets especially suited for use in the oil industry.

EV series lighting fixture Condulets are made for use in Class I hazardous locations where a broken lamp or an accidental ground or short circuit in the lamp receptacle or wires might cause an explosion with ordinary lighting fixtures.

The castings and glass globes are strong enough to withstand any internal explosion and the threaded joints are tight enough to prevent escape of flame resulting from the explosion. The wiring compartment and lamp are seperated by an explosion-proof threaded joint, which prevents an explosion that may occur in either compartment from being communicated to the other.

In type EVA pendent fixtures, the cast aluminum body has a threaded hub with integral bushing for the conduit stem. The hub is equipped with a set screw which may be tightened against the unthreaded part of the stem to prevent the fixture from being loosened.

Hoods are cast aluminum, and are equipped with etched Alzak aluminum inner reflectors which reflect the light that would otherwise be absorbed by the fixtures. Globe holder assemblies con-

Type EVCX Ceiling Type with Dome Reflector.

sist of the clear, Pyrex, impact-resisting, glass globe, which is equipped with sheet aluminum gasket, and the cast aluminum mounting and retaining rings. All joints in the fixtures are threaded and fastened with set screws. Cast aluminum guards are held to globe mounting rings by three machine screws, and reflectors when used, are held between the globe mounting rings and guards or by the guard screws if the guard is not used.

For relamping, the globe holder assembly, including the guard and reflector, if used, is removed as a complete unit.

Type EVA pendent fixtures may be suspended by a conduit stem from GUA or GUF series condulets. Types EVBX and EVCX bodies have four hubs tapped for rigid conduit, three of which are equipped with threaded pipe plugs. This arrangement allows their use in a variety of ways to suit requirements.

Type EVA Pendent Type

Type EPC Condulets are designed as explosion-proof and dust-tight housings for various circuit breakers, control devices, or combinations of such devices.

The housing consists of a body with substantial mounting feet on the back and two round, dome-shaped, threaded covers, which screw into threaded cover openings in the top and bottom of

Type EPC Condulets

the housing. These condulets are furnished with two hubs in the top and two in the bottom, all of which are threaded for conduit of the same size.

The devices are mounted on supporting members attached to the body and are enclosed by the covers. When the covers are removed, the devices are easily accessible for wiring, inspection or replacement. The external operating means are located in or on the front of the body.

United States Steel Corporation Subsidiaries

A space 50 feet long is being used for United States Steel Corporation subsidiaries exhibits. The location is in spaces 464, 364, 365 and 264.

The following subsidiary companies will be represented: American Steel & Wire Company; Carnegie-Illinois Steel Corporation; Cyclone Fence Company; National Tube Company; Tennessee Coal, Iron & Railroad Company, and Universal Atlas Cement Company.

▪ *American Cables*

In the center of the display is a large diorama of an oil field. Traveling in front of this are five model trucks, carrying American Tiger Brand Cables made by American Steel & Wire Company. Each time a truck appears in front of the diorama an inscription flashes telling about the wire and the various samples displayed.

▪ *Cyclone Fence*

To the left of the diorama is a large panel of factory protection fence made by Cyclone Fence Company. This fence is protecting a photomural showing a typical installation of Cyclone factory protection fence, and the proper installations in various oil field locations.

▪ *Cement*

To the right of the diorama are three types of cement graphically portrayed by models, photographs and samples. These new cements are Unaflow, Lumnite and Atlas, all made by Universal Atlas Cement Company. Several small models show the uses and advantages of these three cements.

▪ *Roofing*

In addition, a small diorama shows USS roofing and siding products.

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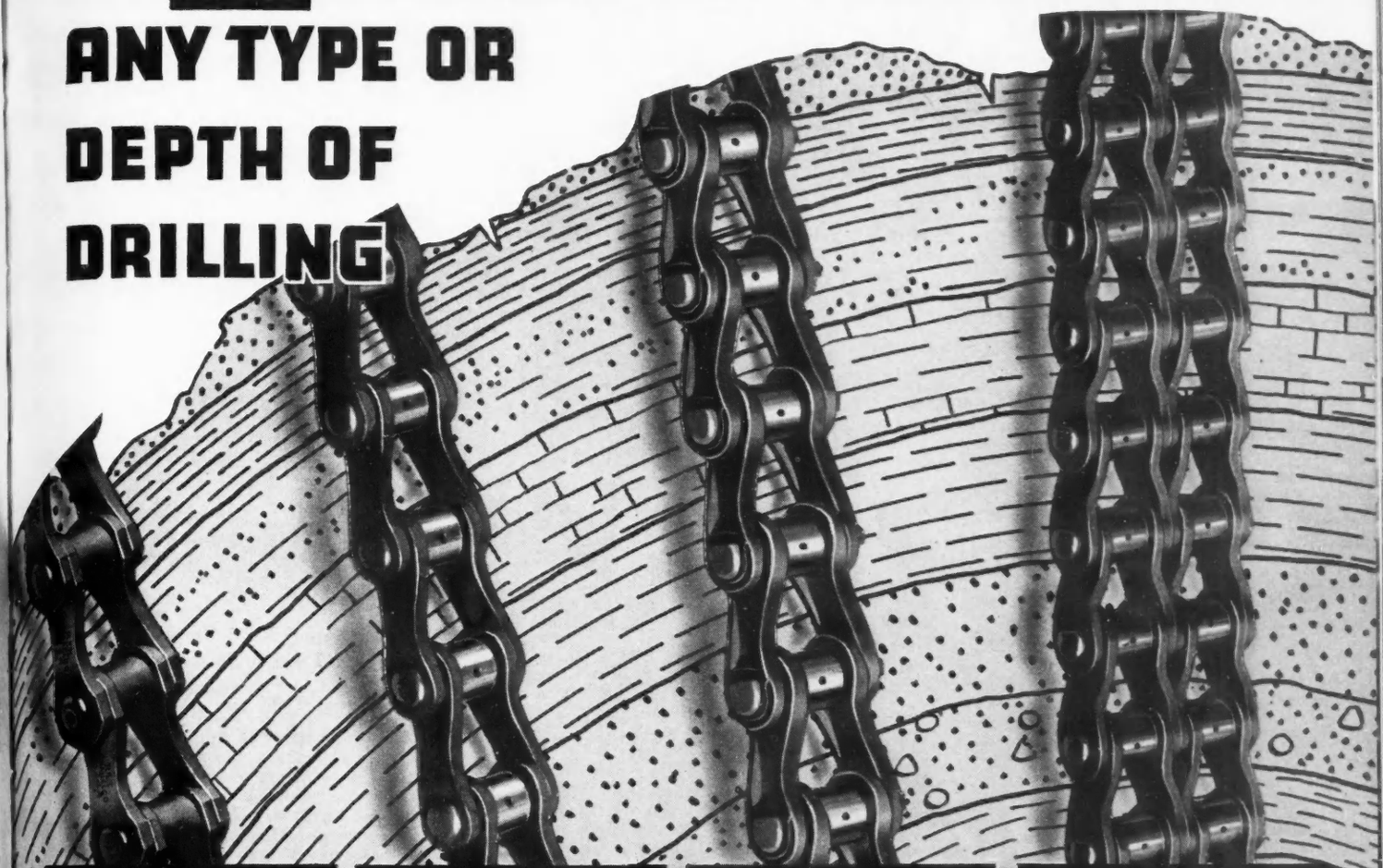
ANY TYPE OR DEPTH OF DRILLING



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STANDARD	**DEEPWELL**	**CHAMPION**	**UNIVERSAL**
A. P. I. 3, A. P. I. 4—Ultimate Strength 48,000 lb. and 112,000 lb.	D. W. 3 – D. W. 4 – Ultimate Strength 60,000 lb. and 125,000 lb.	A. P. I. 3, A. P. I. 4—Ultimate Strength 75,000 lb. and 170,000 lb.	3125–D-3125–Ultimate Strength 115,000 lb. and 230,000 lb.

● Wherever you are, Rex Chabelco Chain can handle your type of drilling—easy or hard—shallow well or deep—at lower cost per foot of hole. Specify the Rex Chabelco Chain you want on your next order.

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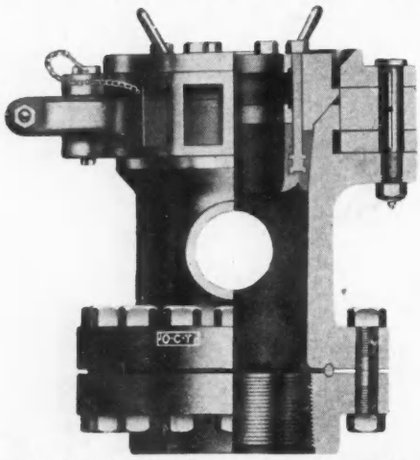
Oil Center Tool Company

Oil Center Tool Company, Houston, is showing its line of blowout preventers, chokes, and heads. Some of the products are described below:

▪ *Blowout Preventer*

The O.C-T blowout preventer permits drilling in and landing casing or tubing against pressure in absolute safety. Its patented design provides a seal around any size drill pipe, casing, or tubing—either standard or flush joint—yet it permits the pipe to be rotated or raised and lowered to prevent sticking.

Simplicity of design and ease of operation are outstanding features of the O-C-T preventer. Briefly, it consists of: a chrome nickel steel body which eithther screws or flanges to the pipe, the



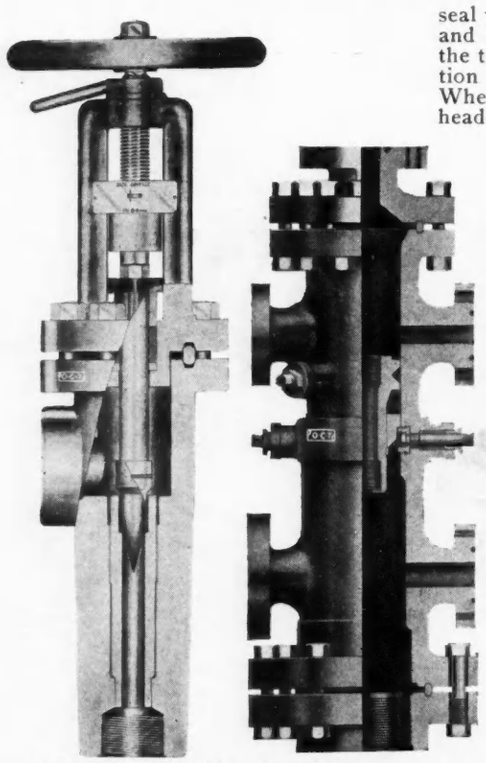
O-C-T Blowout Preventer—Type HF

inside diameter of the body being the same as that of the pipe on which it is used; and a pack-off assembly which latches around the inner pipe and seats in the tapered bowl of the body, and which is locked in position by means of eccentric bands which are hinged to the body. The pack-off rubber is of a special composition, moulded around a steel ring. Stud bolts fasten to this steel ring and hold the pack-off in position under the wear ring. The bottom of the rubber is lipped so that the greater the well pressure the tighter is the seal around the pipe.

The type "HF" preventer shown is provided with a flanged bottom to facilitate installation, particularly on the larger sizes.

▪ *Type "L" Adjustable Choke*

The O-C-T Type "L" adjustable choke is the latest addition to its line of chokes. It is designed especially for wells having high working pressures, up to 5000 pounds. All parts subject to pressure are made of forged steel. Orifice indicator graduated in 64ths of an inch. Removing of bean for renewal or for making proration test, quickly accomplished by unflanging stem and body assembly and changing bean with the use of bean wrench. Not recommended for wells where sand conditions are excessive, but will give satisfactory service under the most severe conditions.



Left: Type L Adjustable Choke. Right: Type CF Tubing Head.

▪ *Type "CF" Tubing Head*

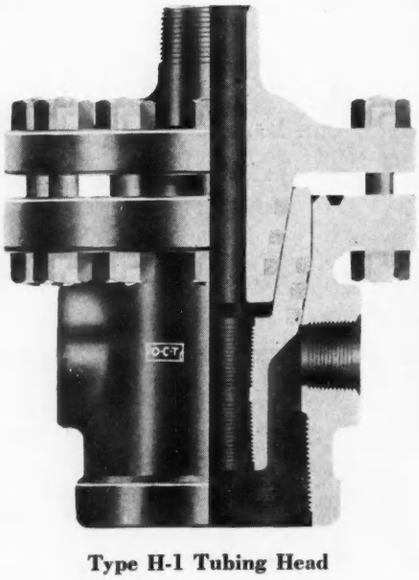
This head was designed to permit installation of complete Christmas-tree on oil string while cement sets. A retractable hanger seat is controlled from outside the head by screws. When hanger seat is retracted into inactive position, bit or packer will pass through head. When hanger seat is in active position, it suspends the string of tubing. Lock down screws force the tubing hanger down in sealing position after tubing has been run and landed in the head. The retractable hanger seal will suspend 200,000 pounds weight and the lock down screws will force the tubing hanger down to sealing position against 6000 pounds pressure. When types "CF," "CF-2," or "CF-3," heads are used they permit the use of the same size blowout preventer equipment as that of the casing which they fit.

▪ *Type "H-1" Tubing Head*

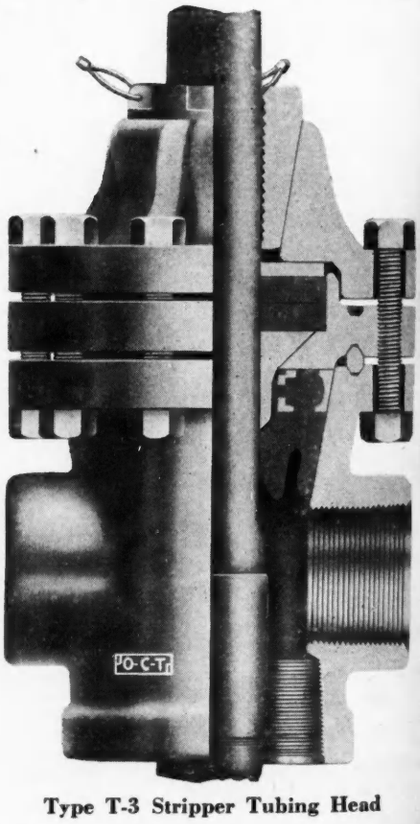
The type "H" Tubing Head was designed to permit drilling in and running and landing tubing through blowout preventer and master gate on top of the main body, and to permit the installation of Christmas-tree without rotating tree to make up threaded connection. The tree is made up on the top cap of tubing head and seats inside of the tubing hanger, making a seal between the cap and hanger. Hydraulic packing in grooves in the hanger and top cap furnish a pressure tight seal. Tested to 10,000 pounds.

▪ *Type "T-3" Stripper Tubing Head*

The type "T-3" Tubing Head permits drilling in under pressure and running and landing tubing with perfect safety because the stripper rubber acts as a blowout preventer, and also permits the raising and lowering of tubing against pressure. The stripper rubber is so designed that the pressure from below forces it against the tubing and wall of the head to effect a seal. Tub-



Type H-1 Tubing Head



Type T-3 Stripper Tubing Head

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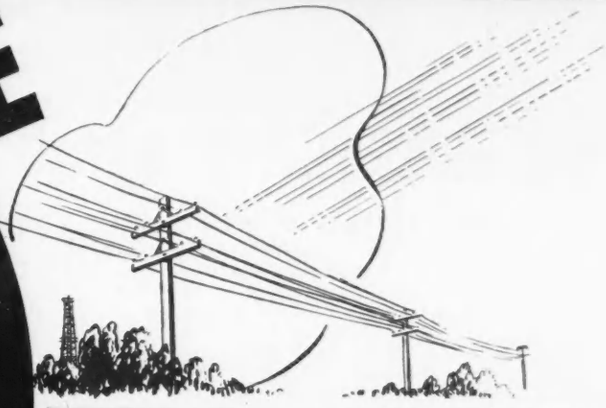

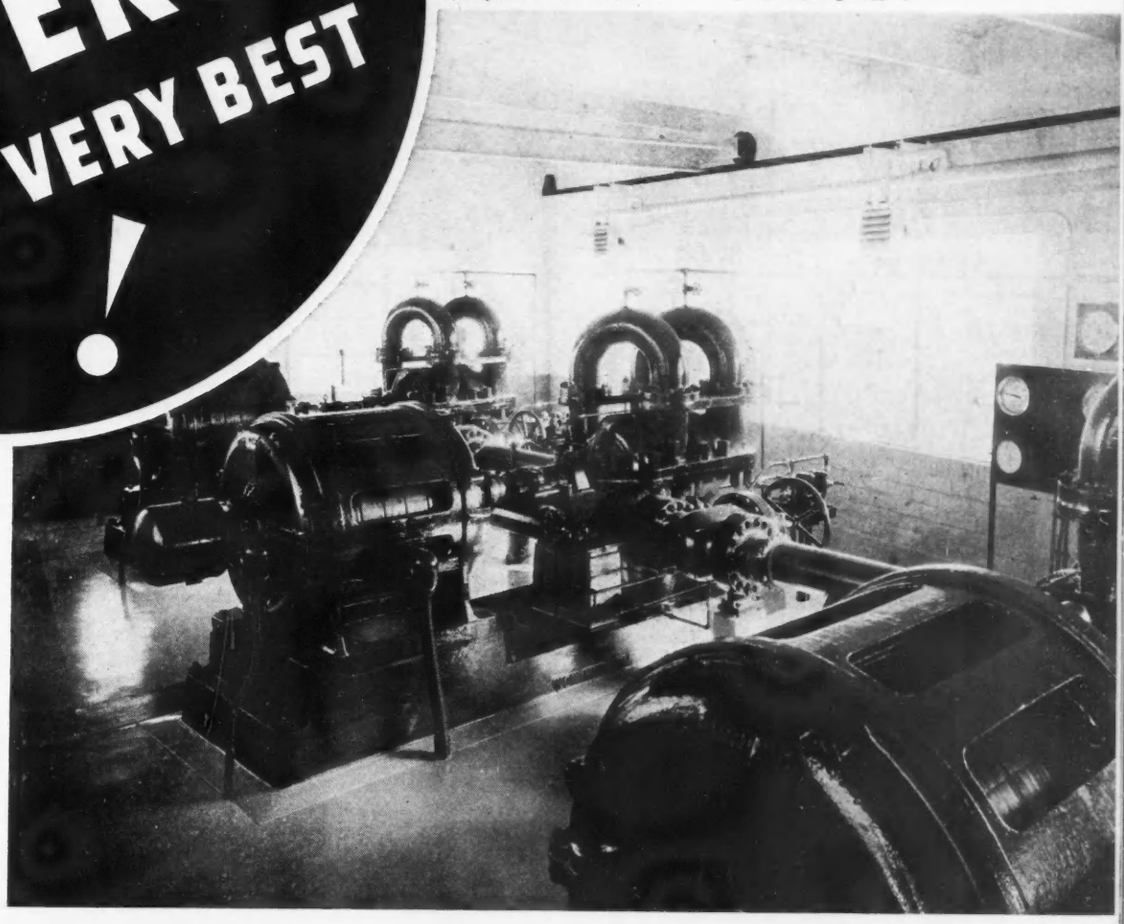

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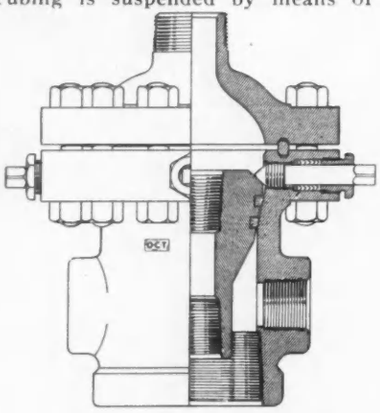
ing is suspended from slips. Tested to 6000 pounds.

▪ *Type "T-16-A" Stripper Tubing Head*

The type "T-16-A" Tubing Head, like the type "T-16-B", permits drilling in and running tubing against pressure. Tubing is suspended by means of a



Type "T-16A" Stripper Head

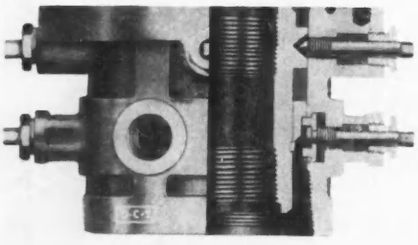
threaded connection in the cap. This head is provided with a stripper rubber which is held in position by lock down screws. Stripper rubber can be replaced through blowout preventer equipment during drilling operations, if necessary, by simply releasing the lock down screws. Tested to 6000 pounds.

▪ *Type "T-16" Tubing Head*

This head is designed to permit drilling in and running and landing tubing through flanged blowout preventer equipment. Tubing is suspended from threaded hanger, which is forced into sealing position against pressure by lock down screws. Tested to 10,000 pounds.

▪ *Type "Q-B" Casing Head*

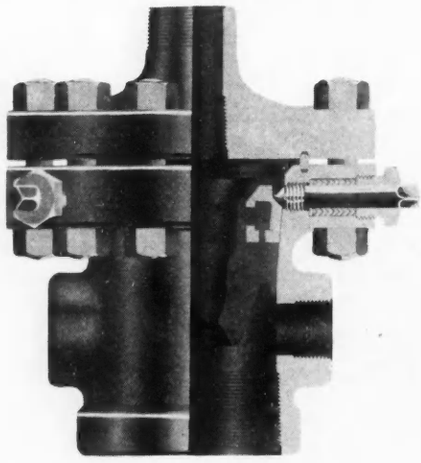
This is a full opening type casing head with retractable seats, designed for use with blowout preventer equipment for running and landing casing under pressure. Hanger passes through either screwed or flanged blowout preventer equipment having same inside diameter as casing heads. Retractable seats permit taking stretch in casing string after cement has set, if desired. Lock down screws are made up, effecting a seal between the hanger and casing head before blowout preventer equipment is removed. Tested to 10,000 pounds.



Type Q-B Casing Head

▪ *Type "J-2" Casing Head*

This is a slip suspension type casing head, provided with stuffing box which packs off between the casing and the head. This is not a full opening head, yet it passes pipe collars. The combination slip bowl-packing gland com-

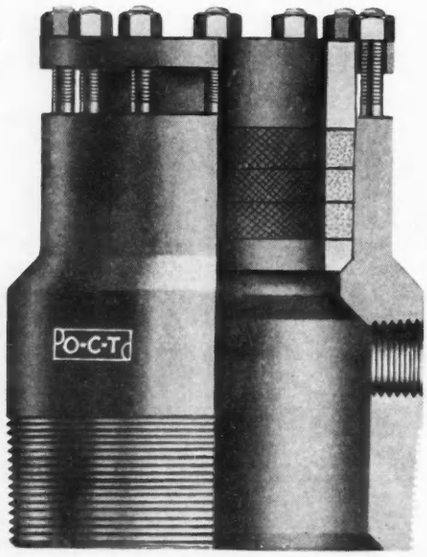


Type "J-2" Casing Head

presses the packing to effect a seal around the pipe, entirely independent of the weight of the casing string.

▪ *Type "G" Casing Head*

This forged steel casing head permits running and landing casing through the body. It is provided with a stuffing box, which effects a seal be-



Type G Casing Head

tween the head and the casing when the packing gland is made up. This packing arrangement will hold well pressure without the weight of the casing hanging on the packing gland.

American Optical Company

▪ *Goggles*

Industrial eye protection through the use of goggles is the message emphasized in the American Optical Company's display at the exposition. The following goggles are being featured:

The American Optical Duralite-50 goggle provides complete all-around protection from almost all classes of impact hazards. It has individual eyecups shaped precisely for the eye, and the perfect fit prevents the entrance of flying particles. It is amply ventilated, has an instantly adjustable ball-chain bridge, and comes with 50 mm. Super Armorplate lenses. Six-curve Super Armorplate lenses providing maximum protection may be supplied as optional equipment.

The American Optical Company Ful-Vue goggle combines efficient protection with the greatest degree of all-around visibility, comfort and appearance. It protects eyes from impact hazards from all angles except particles striking directly from the side. The light, non-corrosive metal frame is identical in general shape and design with the American Optical Ful-Vue spectacle frame, the most popular modern design of eyewear. The goggle has perspiration-proof insulated ear-pieces, pearl nose pads which prevent irritation, and lenses shaped to conform with the eye orbit. Six-curve Super Armorplate lenses having approximately twice the strength of standard lenses are supplied as standard equipment.

The American Optical Duraweld goggle has been designed expressly to protect welders' eyes from flying sparks, scale, dangerous light rays, and glare. It has individual eyecups whose perfect fit prevents the entrance of sparks and stray light. It is amply ventilated, has an instantly adjustable ball-chain bridge, and is fitted with Noviweld 50 mm. lenses.

Security Engineering Company

Models and full size Sievers reamers, made by Security Engineering Company, are on display as part of the exhibit of Wilson Supply Company, who are authorized representatives for Gulf Coast fields.

Sievers Reamer

Demonstrations illustrate the effectiveness of the Sievers reamer with cutters set at an angle, which permits these cutters to lead into the formation with a slicing, shearing action which results in fast reaming of round, full-gauge hole. Other demonstrations reveal how the barrel-shaped cutters contact from 25 to 35 percent of the circumference of the hole, with the result that the drilling string is perfectly stabilized, and rotates on a true vertical axis.

A patented locking device provides every assurance against loss of parts in the hole, but permits quick and easy assembly and disassembly on the derrick floor.

Both single 3-point and double 3-point reamers are on exhibit.

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MARMON-HERRINGTON ENGINEERS PRESENT MOST IMPORTANT DEVELOPMENT IN TRACTOR DESIGN

Now you can obtain a powerful track-laying tractor that maintains an average road speed of 25 miles an hour and better. A tractor which combines with this unprecedented road speed, a smoothness and quietness of operation, an ease of riding and an economy of fuel consumption never before possible in track-laying tractors.

This revolutionary performance is made possible by new and exclusive features designed and developed by Marmon-Herrington engineers. Foremost is an entirely new type of track which combines the strength of steel with the cushioning effect of rubber, eliminating the noisy clatter and vibration inevitable with steel block type of track. Increases mileage of track as much as 500%, and permits operating tractor on any highway. Hull is watertight, and the unit will operate in more than 36 inches of water. Center of gravity is so low the tractor can be turned on any hill it climbs. Can be pivot-turned safely either from a standing position or from its highest forward speed.

Elimination of friction in the driving mechanism results in greatly increased fuel economy, an average of 4 to 5 miles per gallon of gasoline being obtainable. The use of standard automotive parts throughout the entire construction makes the tractor easy to service. All parts, including the engine, are readily accessible. Offered in three models: TA-20, TA-30 and TA-40 with rated draw bar horse power of 20, 30 and 40 respectively. Complete description is yours for the asking.

See Us at the
OIL WORLD EXPOSITION
HOUSTON • OCTOBER 11-16
Transportation Equipment Co. Space

MAJOR OIL COMPANIES USE ALL-WHEEL-DRIVES FOR FASTER RESULTS . . . AT REDUCED COSTS . . .

Records kept by leading oil companies show that Marmon-Herrington all-wheel-drive trucks last longer, require less servicing, provide more hours of crew time. You find Marmon-Herringtons doing the tough jobs—jobs that can't be assigned to ordinary hauling equipment. The Marmon-Herrington line includes all-wheel-drive Ford V-8's on the 112-inch wheel base passenger, light delivery and commercial car chassis, as well as on the standard truck chassis (both 4- and 6-wheel-drive); also the standard Marmon-Herrington 4- and 6-wheel-drive units with capacities ranging up to 50,000 pounds. May we send you complete descriptive literature?

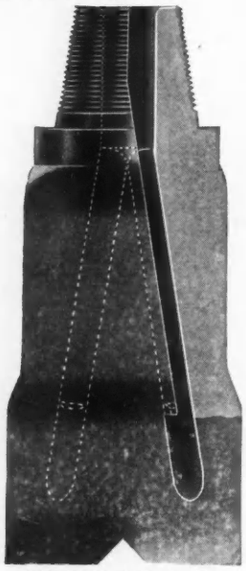
MARMON-HERRINGTON COMPANY, INC., *Factory and General Offices,* **INDIANAPOLIS, IND.**
★ *World's Leading All-Wheel-Drive Engineers and Builders* ★

★MARMON-HERRINGTON *All-Wheel-Drive* TRUCKS
AND THE NEW *HIGH-SPEED TRACK-LAYING TRACTOR*

Texas Iron Works

Texas Iron Works, Beaumont, Texas, has a full line of its products on exhibit in Booths 244, 246, 248, 345, 347 and 349. Some of the items are described below:

▪ *T-I-W Full-Hole Bit*



T-I-W Full-Hole Bit

Texas Iron Works, Houston, is exhibiting its T-I-W full-hole bit, which has a full hole drilled through the shank, eliminating pump pressure turbulence cutting the bit shank and drill collar. The manufacturer claims it does not require much weight to drill, which makes for straight hole.

T-I-W Combination Pilot, Drilling and Reaming Bit

▪ *T-I-W Combination Pilot, Drilling and Reaming Bit*

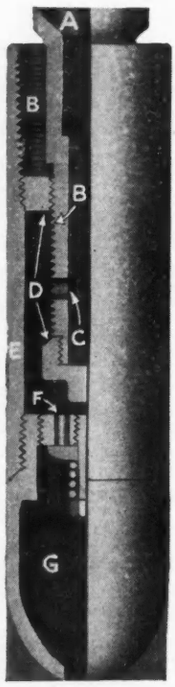
This bit may be used as a pilot bit when reducing the hole, and the reduced hole is always in center of the large hole. It can also be used as a reaming bit. The pilot guides bit to center of reduced and reamed hole. It may also be used as a straight hole bit, as a drilling bit and as a bit for drilling hard formations.

▪ *T-I-W Short Type Triple Seal Back Pressure Valve*

This valve puts the screen very close to the bottom of the well and is ideal in shallow sands. It eliminates unnecessary blanking off of pay sand. The valve is so constructed that a very short length, nine inches, is only used for the valve housing. The mechanism of the valve extends up inside the screen allowing area for a flow around the mechanism.

▪ *T-I-W Packer and Setting or Letting-In Tool*

This tool is used for sealing liner to casing where liner rests on bottom of hole and top terminates in bottom of casing to keep sand shale, or formation from heaving up outside of liner into casing; to keep gas from escaping up outside of liner to eliminate setting a full string of pipe; as a bottom-hole plug inside screen or perforated to cut off water or sand leaking through back-pressure valve; and to cut off water between two sands.



T-I-W Triple Seal Back-Pressure Valve

▪ *T-I-W Triple Seal Back-Pressure Valve*

The entire inside of the T-I-W triple seal back pressure valve is made of bronze and the guide plug of cast iron, so that it can be easily drilled out in the event the well is to be deepened through liner. This valve eliminates sanding up.

▪ *T-I-W Tubing Slips and Spiders*

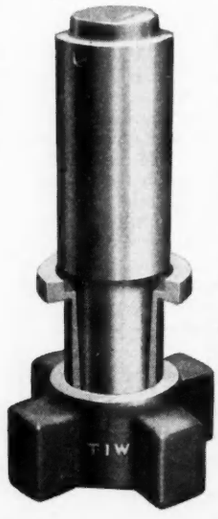
T-I-W tubing slips and spider may be used at any place where necessary to run a string of tubing. They are designed with a small degree of taper, thus greatly increasing the holding capacity. A releasing feature insures against biting and crushing the pipe. They are made in three segments, like the reliner type slips.

Assembly showing Special Tubing Slip and Spider

▪ *T-I-W Pump Compounding Valve*

T-I-W Pump Compounding Valve

This valve is in one unit and saves time in rigging up or disassembling pumps. It also can be operated in compound or single stage, and may be changed quickly over where time is a factor in combating high-pressure gas or obtaining circulation in stuck drill stem. Connection to pump is stuffing box type, which acts as swing when raising or lowering suction. The valve is manufactured of the highest quality alloy steels carefully machined.



Wrist Pin

▪ *T-I-W Wrist Pin*

The T-I-W improved wrist pin is for use in drilling and pumping rigs. A T-I-W wrist pin will go into a crank where it is worn not more than one-eighth inch. There is no driving to put pin in and out of hole, simply place tapered bushing in crank arm and insert wrist pin in bushing and tighten the nut, which draws tapered pin shank into tapered bushing.

▪ *T-I-W Screen Setting Assemblies*

With T-I-W screen setting assemblies hold down slips are optional with the user, and they may be used with regular type back-pressure valve or with triple seal back pressure valve. A patented flow-back valve is used only in wash pipe when setting screen with tubing and setting tubing on

NL PRESSURE TREATED LUMBER *cuts production costs*

Thoroughly seasoned wood, pound for pound, is as strong as mild steel.

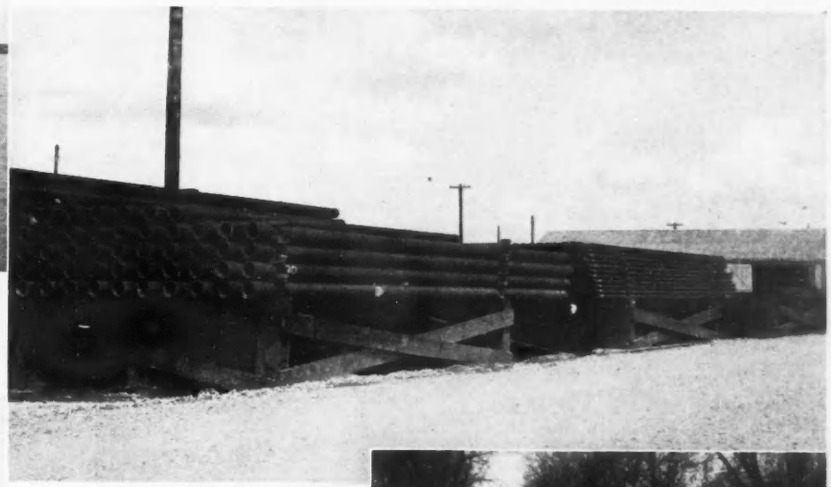
That same wood will last 15 times longer when pressure treated by any one of National's nine plants. Yet . . . that's only the beginning!

NL CREOSOTED Timbers and Piling, and NL Lumber treated with either WOLMAN SALTS or CHROMATED ZINC CHLORIDE are, by actual tests, cheaper oil field construction materials, figured on a cost per year basis.

NL Piling and Timbers are expertly and carefully treated by National's engineers. Each piece is branded with the NL Trademark after treatment. It's your guarantee of permanent protection against termites and decay.

NL derrick sub-structures stand up under strain and abuse caused by the derrick. Act as fire retardant. Are protected against marine borers.

Below: **Pipe racks built of NL pressure treated materials resist wear and tear. Can be knocked down and moved many times. Wood acts as shock absorber. Has high salvage value. Is cheaper in the long run.**



Left: **Portable houses built of NL Lumber can be moved many times during their life.** ***Right:*** **Heavy-Duty bridges last longer, are safer when built with NL CREOSOTED Materials.**

Be sure to visit our booth at the OIL Show. It is part of the Koppers exhibit.

NATIONAL LUMBER & CREOSOTING COMPANY

(INCORPORATED)

SUBSIDIARY OF THE WOOD PRESERVING CORPORATION

TEXARKANA, ARK.-TEX. HOUSTON, TEXAS

LOOK FOR THE (NL) ON EVERY PIECE. IT'S YOUR GUARANTEE FOR PERMANENT PROTECTION.

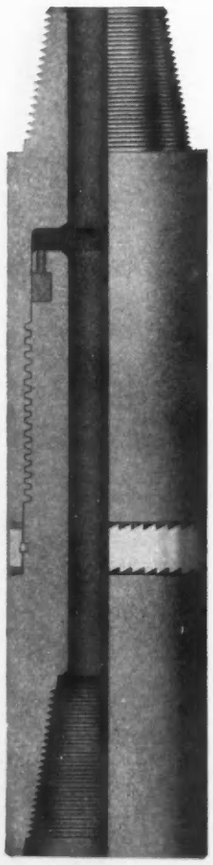
ground seat at top of packer. The flow-back valve is closed while washing well, returns going through wash pipe and back-pressure valve, but when the wells come in, flow comes through screen through flow-back valve to inside of wash pipe and up through tubing.

▪ *T-I-W Friction Three-Piece Reliner Type Slips*

These slips are a three-piece unit that keeps the segments in alignment and obviates one segment getting out of alignment and crushing pipe. The three segments make a three-point bearing on the circumference of the rotary bowl, making same self-centering and giving a uniform bearing area on the pipe. The slips have a bearing area against the pipe of 13¼ inches lengthwise and almost 100 per cent of the circumference. The handles are convenient to grip and are long enough to clear elevators, and curved to clear top of rotary, eliminating any danger of injury to operators' hands. They are so constructed they will not drop through rotary bowl and are easy to handle.

▪ *T-I-W Safety Joint*

The T-I-W safety joint is designed so that it will not back off going into the hole, yet will break out on left rotation. The manufacturer recommends that it be run above shale drilling assemblies, all fishing tools, cutting tools, lace joints, reamers and roller bits.



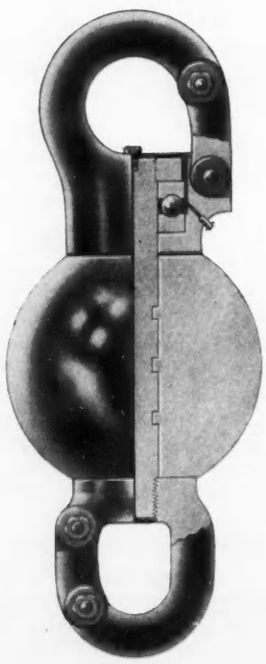
T-I-W Safety Joint

▪ *T-I-W Drill Stem Safety Valves*

These valves are used when high pressure gas is encountered. These valves prevent blowing out of the well through the drill stem. The top and bottom connections can be furnished

T-I-W Plug Type Drill Stem Safety Valve

with either tool joint or pipe threads. The screw type valve is opened as the joint above valve is screwed on, and closed as the joint is unscrewed. The plug type valve is opened and closed by means of a wrench.



T-I-W Rod Line Weight

▪ *T-I-W Rod Line Weight*

The rod line weight is used where draw works, tubing hoist, or portable winch is used in pulling rods and weight is used to bring line down. It weighs about 300 pounds and is 28 inches over all and tested up to 20,000 pounds. It is made of 2¼-inch hammered shaft with cast iron ball 11½ inches in diameter cast on it. One end is machined to receive becket and bearing; the other end with forged steel hook, ball thrust bearing which is oil bath, and so assembled in becket that sand and dirt cannot get to bearings and deteriorate them.

▪ *T-I-W Friction Two-Piece Reliner Type Slips*

The company also is showing T-I-W friction two-piece reliner type slips, the unique design of which prevents slips from folding together and dropping through rotary bowl. These slips also are made in tubing sizes with hinged bowl.

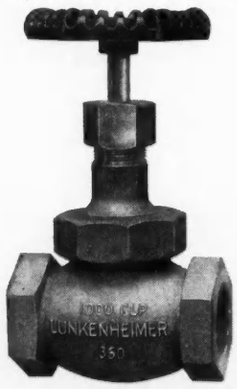
▪ *Liners for Reliner Type Slips*

Texas Iron Works liners can be resharpened or when completely worn out new liners may be installed in reliner type slips. Liners for different sizes of pipe can be used in the same slip, thus saving the operator from having to buy different slips for different size pipes.

The Lunkenheimer Company

▪ *Valves*

Featured in the display of The Lunkenheimer Company, Cincinnati, Ohio, is a line of 350-pound SP bronze and steel gate, globe, angle and check valves, designed for deep oil well drilling operations and high-pressure gas, oil and hydraulic service. The bronze



Lunkenheimer Valve

valves will withstand a gas-liquid pressure of 1000 pounds. A valuable feature in the bronze gate valves is renewability of the seat rings in one inch and larger sizes.

▪ *Other Products*

The exhibit also includes an interesting display of valves, boiler mountings, lubricating devices and other specialties used in connection with producing and pipe line equipment, and carried in stock by Lunkenheimer Oil Country Distributors.

THAN STEAM

"With Cummins Power," says George P. Livermore, "you have such power and flexibility that you drill the hole FASTER than *any competitive power*, including steam."

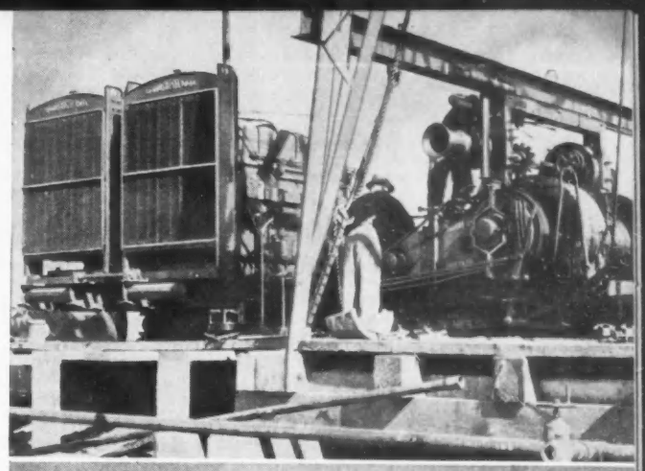
Mr. Livermore, who now owns and operates 12 Cummins Diesels, speaks from experience. One of his rigs has just completed drilling the largest well to date in Harper Pool, Ector County, West Texas . . . 1312 bbls., and another the largest producer in the Eunice Field, Lea County, New Mexico, estimated at 25,000 bbls. Cummins Engine Company, 1600 Wilson Street, Columbus, Indiana.

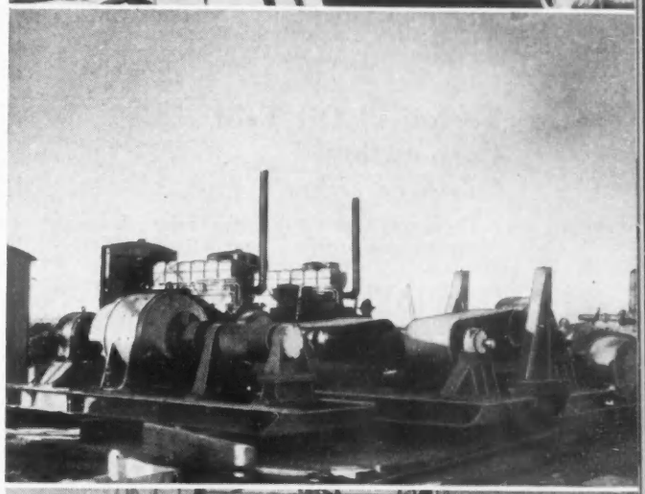
●

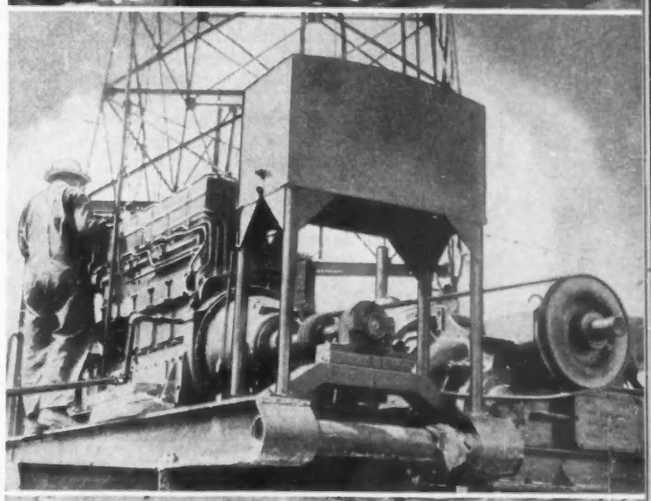
Visit our exhibit at the OIL WORLD EXPOSITION

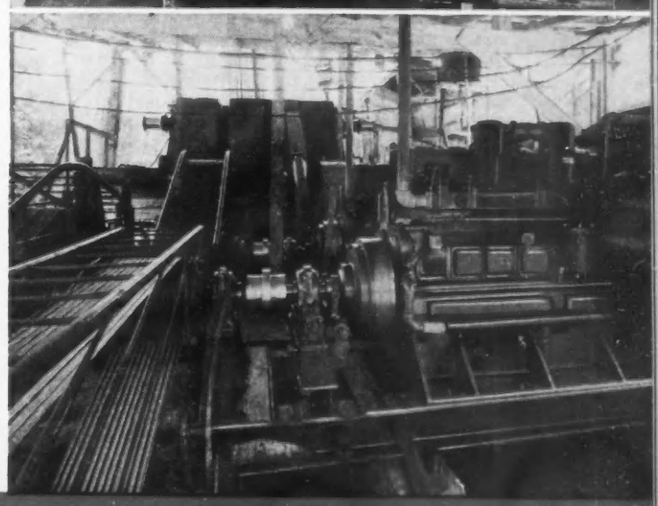
(Space 1001 outside; space 202 inside)

October 11 to 16 • Houston, Texas









MPANY · FORT WORTH TEXAS

Mid-Continent Territory

Spang, Chalfant & Co., Inc.

▪ ***Casing and Drill Pipe***

Enlarged models and full size cutaway samples of Standard seamless shrink thread drill pipe and Extreme Line casing are featured in the exhibit of Spang, Chalfant & Co., Inc. of Pittsburgh, Pa.

A moving picture shows the essential threading operations required in the manufacture of both products and will include the detail of assembling the tool joints to the drill pipe.

Technical Oil Tool Corporation

▪ ***Drift Recorders***

Technical Oil Tool Corporation, Los Angeles, California, has a complete display of Totco drift recorders, showing the various types of container bodies for different methods of operation. Several testing machines to show the accuracy of Totco recordations are also on exhibit.

Halliburton Oil Well Cementing Company

Halliburton Oil Well Cementing Company, Duncan, Oklahoma, is exhibiting at the oil show a complete line of its equipment, featuring its cementing equipment, floating equipment, formation testing and measuring devices, as well as the Four Wheel Drive trucks.

▪ ***Multiple Stage Cementing Device***

This device is used in deep well cementing and makes it unnecessary to pump all the cement down the entire length of the casing and upward behind the casing. It reduces the pump pressure required to place the cement by about 50 percent and protects shallow production formations behind the casing.

▪ ***Full Hole Cementing Device***

This device represents a modern method of cementing combination strings, which consists of a blank string of casing, on the lower end of which is a perforated section, or screen, of the same diameter as the blank casing. If a full-sized hole is drilled into the producing sand, a screen or perforated liner of the same size as the casing is run on the bottom of the casing, establishing a circulation down the entire length of both the blank and perforated sections of the combination string to remove cavings, cuttings and heavy muck from behind the screen, and the casing is cemented above the screen, all in one continuous operation. This method provides up to 30 percent more screen area, 60 percent more drainage surface and allows 30 to 50 percent more core recovery.

▪ ***Cement Wash Pipe Lining***

Cement wash pipe lining for screen or perforated liners may be used with any screen or perforated liner or in the perforated section of a combination string. The lining is very easily drilled out of the perforated section after it has served its purpose.

▪ ***Co-Axial Spiral***

Co-Axial Spiral on display prevents, according to the manufacturer, direct contact between the casing and hole at critical points in the well, thus giving additional assurance of a thorough distribution of cement at those points.

▪ ***Floating Equipment***

Floating equipment exhibited by Halliburton includes float collars, guide shoes and float shoes for use with all makes of casing and casing threads. The designs provide ample floating strength for even the longest strings of casing, efficient guiding of the shoe, minimum interference with establishing circulation after the casing is landed, minimum interference with the flow of cement and drilling out ease.

▪ ***Formation Testers***

The method of obtaining a test for the productivity of formations while drilling a well, without setting a string of casing and bailing. One device is also used for making water shut-off tests in casing after cementing.

▪ ***Measuring Devices***

Halliburton Oil Well Cementing Company is also showing its complete line of measuring devices from the standard type to the heavy duty type.

▪ ***Four Wheel Drive Trucks***

The success of the Four Wheel Drive principle in getting around difficult road conditions in the oil fields is a feature of Halliburton oil field service. These trucks are available to the oil industry and are serviced by Halliburton Oil Well Cementing Company.

American Hammered Piston Ring Division Koppers Company

▪ ***Piston Rings***

Koppers Company, American Hammered Piston Ring Division, Baltimore, Maryland, has on display at its booths 500 and 502 its latest types of piston rings, including power rings, oil control rings, single piece seal rings, multiple seal rings, gold seal rings, silver seal rings and cast iron bronze rings.

Turco Products Incorporated

▪ ***Cleaning Materials***

Turco Products, Incorporated, Los Angeles, California, is showing among its many developments, several new materials and methods for equipment cleaning and maintenance in the oil industry.

The following products will be on exhibit: Turco Mulsine, a material for removing grease, etc.; Turco Acryl, which is being used for scale removal on condensers, etc.; Turco Railroad, a powder compound for general heavy duty, hot tank and steam spray cleaning; Turco De-Scalper, a liquid compound for removal of heavy water scale from water and other equipment parts without injury to metals; Turco Petmusol, used for cleaning tank and heavy equipment in general; Turco Vitol, a white emulsion which is being used for the safe and fast cleaning of painted surfaces on equipment, trucks, buildings and other finely finished areas.

France Packing Company

▪ ***Metallic Packing***

France Packing Company, Tacony, Philadelphia, Pa., is exhibiting a complete line of metallic packing for use on all types of engines and compressors with reciprocating rods and stems. The packing is of the segmental floating ring type, and is made either of iron, bronze or micarta, depending on the service it is to be used on. It is satisfactorily holding pressures as high as 15,000 pounds.

A special feature of France packing lies in the cut of the ring. The ring is cut in three pieces on the lines of an equilateral triangle, and will always maintain a tight joint as long as the rod is round.

Oakite Products, Inc.

▪ ***Cleaning Materials***

Oakite Products, Inc., New York, N. Y. exhibits its various products and shows methods for handling the various cleaning operations presented by the producing, refining, transportation, and distributing divisions of the oil industry.

In their booths 565 and 566, one of the featured operations will be stripping of paint from oil storage tanks, tank cars and similar equipment. Removal of paint from equipment, prior to refinishing, has been placed on a faster, more thorough and more economical basis through the recent development of a patented method known as the Hot Oakite Flow-on Method. It makes possible the stripping of large areas at one time with little manual effort, and without fire hazards of any kind.

The Oakite display will also visualize the importance of removing insulating deposits from heat exchange equipment, and show the methods which have been found most successful for doing this work, without the need for disassembling the apparatus being treated.

The Timken Roller Bearings Company

▪ ***Roller Bearings***

The Timken Roller Bearings Company, Canton, Ohio, is exhibiting at booths 464 and 466 a complete line of tapered roller bearings used in oil field engines, pumps, powers, hoists and swivels. Both single and double row bearings are shown together with the special flat type thrust bearing that is used in heavy swivel construction.

POST CARD
Dear Friend—
Were having a great time
Wish you were here
to enjoy — the golf —
Swell weather — the
great Oil Show as
well as the other things
Houston has to offer —
Come in and see our
Exhibits Your Texasteel Friend
OIL WORLD EXPOSITION Houston OCT 11-16
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To the Oil Men of the World
THE HOUSTON EXPOSITION BUILDING
Where the Oil World Exposition
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TEXASTEEL
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Inside Exposition
Building and
1008-1009
Outside Space
TEXAS STEEL COMPANY » Manufacturers « FORT WORTH
TEXASTEEL - OILFIELD PUMPING EQUIPMENT
ELECTRIC STEEL SUCKER RODS—JACKS—SWINGS—BACKSIDE ASSEMBLIES—UNITS—KNOCK-OFFS

The Thew Shovel Company

▪ ***Dragline Units.***

The Universal Crane Division of The Thew Shovel Company, Lorain, Ohio, builds a line of crawler dragline units in ¾, ⅝, ½ and ⅜ yard capacities which, due to several design features, are particularly applicable to oil field operations. These machines are marketed in Texas through Browning-Ferris Machinery Company of Houston and Dallas, who will have on exhibit at the Oil World Exposition in Houston a ½-yard Lorain 30 dragline unit, illustrating the following features:

These units are built on the principle that capacities depend on stability and strength, not weight, and are designed to give the greatest capacity at the minimum total weight and resulting ground pressure.

To achieve this, the turntable is built with a sloping machinery frame, a patented feature. All the necessary operating machinery is mounted in a vertical type machinery frame which slopes or tilts toward the rear of the unit. This shifts the counter-balancing effect of the necessary machinery as far back of the tipping point as possible and makes it work to the maximum in counterbalancing loads lifted. Unusually high capacities result with minimum weight and ground pressures.

The turntable is also built around the center drive design, a simplified design in which an efficient chain drive transmits the full engine power directly to a center drive pinion which in turn powers directly the hoist and swing or travel shafts, eliminating long gear trains and involved power transmissions that lose efficiency.

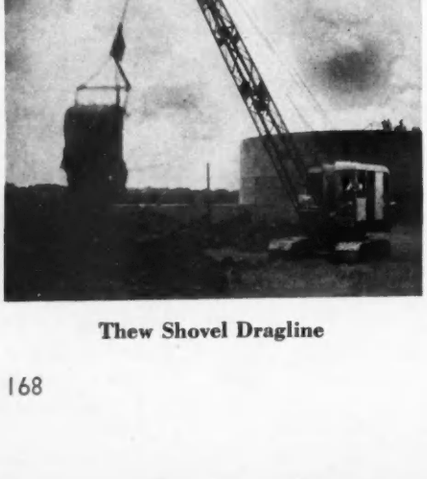
This turntable is mounted on a center drive crawler in which only two propelling shafts are used—a vertical travel shaft and a horizontal propelling shaft. All crawler units have two travel speeds—a high speed of 1½ miles per hour for ordinary travel and ¾ mile per hour with double power for tough going. All the two-speed mechanism is located accessibly on the turntable.

Steering of the crawler is controlled from the operator's position regardless of the turntable swing position. Units can steer in either direction in wide radius curves of pivot turns and possess agility and responsive steering for close work.

The minimum ground pressures achieved by the minimum weight of the unit are further reduced by the use of extra wide treads on these units. Thirty-inch wide treads are available for the Lorain 40 and 37, and 22-inch wide treads for the Lorain 30 and 27. No changes other than the tread belt are necessary to apply these wider treads.

These draglines are also equipped with a patented fairlead possessing several cable savings features. The fairlead is mounted at the front of the turntable. A direct cable lead from the drum passes, first, between two horizontal sheaves, thence between two vertical sheaves. The latter are free to swivel and thus maintain a direct lead to the bucket at all times. The horizontal sheaves have geared or interlocking flanges, forming a narrow throat for the cable which keeps all cable side leads between front and rear sheaves within the approved limits of good cable practice. In the transfer of the cable from one sheave to another, the cable always contacts a sheave already revolving in the proper direction at the proper speed, thus eliminating destructive and expensive cable scrubbing.

Another aid to long hoist cable life is the boom head rope and sheave guard. This cast steel housing provides three long horizontal rollers to guide cables accurately to the sheaves and prevents their jumping off or jamming. End rollers give cable and sheave protection on end pulls and casts.



Thew Shovel Dragline

Cameron Iron Works, Inc.

Cameron Iron Works, Inc., Houston, is exhibiting drilling and producing controls and other devices in booths 604 and 705.

▪ ***Blowout Preventers***

Several Cameron blowout preventers are on display. Among these are the following: 3000-pounds and 6000-pounds test pressure operated preventers; double-screw model manually operated units in 3000-pounds, 6000-pounds and 10,000-pounds test sizes; in the single screw model are 6000-pounds and 10,000-pounds test manually operated blowout preventers; and the Cameron wire-line core barrel blowout preventer.

▪ ***Gate Valves***

Cameron pressure operated gate valves of 3000-pounds and 6000-pounds test, and its resilient seal gate valves of 8000-pounds test are included in the exhibit.

▪ ***Other Products***

A number of other Cameron made products are shown, as follows: Drilling control hookups; several types of safety Christmas trees; "Old Ocean" type long-string bradenhead; rotary core barrels; master control tubing heads; resetting tubing plugs, and an expansion tube flow choke.

Fluid Packed Pump Company

▪ ***Well Pumps***

Two new pumps especially designed for use in marginal type and other comparatively small production and shallow wells are introduced to the trade at the Oil-World Exposition in Houston by Fluid Packed Pump Company, Los Nietos, California, exhibiting in Booth 254.

The new pumps are known as the "Marginal" fluid packed pump and the "Petrol A" groove seal pump.

In addition to these new pumps, Fluid Packed Pump Company has a complete exhibit of its other pumps, including the positive pull type, removable type and rigid type fluid packed pumps and the "Producer" and "Volume Producer" groove seal type pumps. The complete line of Flupaco pumping accessories will likewise be displayed.

S. K. F. Industries, Inc.

▪ ***Bearings and Transmission Appliances***

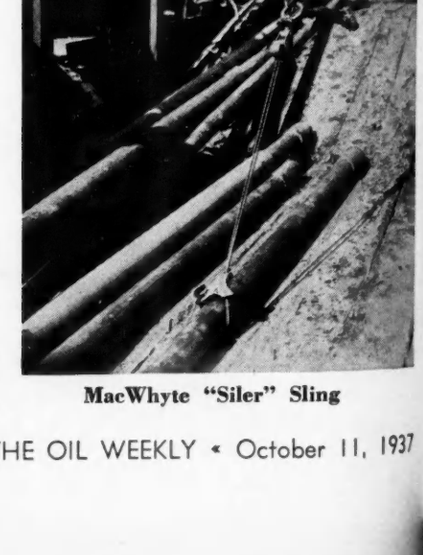
In spaces 1423-1425 of the exposition, S. K. F. Industries, Inc., Philadelphia, is exhibiting a complete line of ball and roller bearings and transmission appliances.

MacWhyte Company

▪ ***Wire Rope***

MacWhyte Company, Kenosha, Wisconsin, is exhibiting its complete line of wire ropes used in the oil fields, amplified by pictures, and in addition has a special demonstration of its new Silersling. The Silersling has been developed for use in the oil fields for handling miscellaneous equipment around oil derricks, including core barrels, reamers, tools, bits, pipe, etc.

The display of MacWhyte Company also includes wire rope for rotary drilling, cable tool drilling, and other wire rope used in conection therewith, such as sand lines, bailing lines, winch lines, tow lines, cleaning-out lines, etc.



MacWhyte "Siler" Sling

Complete DEHYDRATION OF ALL WET CRUDE

• AS PRODUCED •

pays dividends

TO ALL DEPARTMENTS

Petreco Electromatic Dehydration of all wet oil as produced assures important advantages to every department of oil companies handling such crudes. Savings in handling costs alone more than cover the low treating expense; while the benefits and reduced operating costs are cumulative from the well to final destination of finished products. These advantages and savings are of sufficient importance to merit the careful investigation of production, pipe line, refinery and marine executives. Petreco engineers will make such investigations easy by submitting detailed information relative to "cut" oil problems and handling costs, and making analyses of individual procedure, without obligation.

PETROLEUM RECTIFYING COMPANY OF CALIFORNIA

General Offices: 530 West Sixth Street, Los Angeles, California
Branch Office: Houston, Texas . . . . . Branches and Service Men In Principal Oil Fields

PETRECO

REG. U.S. PAT. OFF.

THE ELECTRICAL PROCESS FOR DEHYDRATING CRUDE OIL EMULSIONS

Continental Supply Company and Affiliated Firms

Under the auspices of The Continental Supply Company, Dallas, Texas, a wide assortment of drilling and production equipment produced by affiliated manufacturing companies will be shown at the Oil World Exposition, Houston.

Occupying a chain of booths on Aisles 2 and 3 of the Exposition Hall, individual booths will quarter the exhibits of the respective associated manufacturing companies as follows:

▪ Gardner-Denver Drilling Engine

Affording visitors the opportunity to view late designs in steam drilling engines, the recently announced 9½x8 Gardner-Denver Company's vertical model is on display in Booth 429. The engine is equipped with a manually adjustable cut-off, easily set to meet load requirements. Steam valves are of the inside admission piston-valve type and are light, perfectly balanced and easy to reverse. Valves in this engine are tight under high pressures and with super-heated steam, while the steam cylinders are insulated with mineral wool covered with sheet rock.

Exceptionally compact and economical, this unit is particularly desirable for driving a slush pump by means of V-belts, flat belts or chain drive, and is also adaptable for driving the rotary table directly.

▪ Fairbanks, Morse Pumping Engine

A three-cylinder, two-cycle, 6x6½ Model 34 vertical engine, made by Fairbanks, Morse Company, is exhibited in Booth 431. Especially designed for pumping service, the essential moving parts of this engine are identical with those of a proved design in long industrial use.

Outstanding features of this engine include heavy pistons for dissipating heat; heavy crankshafts, perfectly counterbalanced; and heavy flywheels to provide unusually smooth operation. Design of the governor permits variation of the degree of sensitivity, a highly desirable quality in oil field service. Of special note concerning this engine is its freedom from vibration.

▪ Falk Corporation Gears

Occupying a prominent spot in the Continental exhibit is the Falk Corporation's 60-CD gear unit, representing a line of double reduction units. Symmetrically designed and of sturdy construction, it is also equipped with double low-speed bearings on both sides. This unit, which is in Booth 433, is adaptable for single or twin-crank portable, pumping equipment or either back cranking or service sprocket.

Herringbone type gears in this unit were pioneered by Falk, cut on special machines designed and used exclusively by Falk. Double-end high and low-speed shafts afford especial advantage, permitting assembly of the brake or pulley on either side of the high speed shaft. The Falk trough system of lubrication insures an unfailing supply of clean lubricant to all bearings, while special oil retainers prevent any leakage of oil and seals the lubricant against the admission of dirt and dust particles. Ratio of the Falk 60-CD Unit is 29.8:1, having a peak torque capacity of 100,000 in. lb. at 20 S.P.M.

▪ Climax Engineering Engine

Adjacent to the above described exhibit and occupying Booth 435, is a Model N4B four-cylinder "Blue Streak" engine, made by Climax Engineering Company. Bore and stroke of this engine is 5¾ x 6½, with valve-in-head design open-box base type for natural gas operation. An extra heavy fly-wheel makes this engine especially desirable for oilfield pumping service. Its water-cooled exhaust manifold, vapor-proof ignition, safety-devices, oil-filter and oil-bath type air cleaner are a few of this engine's outstanding features.

▪ Emsco Rotary Table

The newly designed Type JA-20½ rotary machine of Emsco Derrick and Equipment Company is on display in Booth 334. This is a small opening machine (20½-foot) permitting the load-bearing to be reduced in diameter, thereby affording higher rotating speeds, together with increased load rating. Positive prevention of oil leakage from the machine or the intrusion of mud and water are permanent safeguards. Easy adjustment of the hold-down and load-bearing is provided, while the base is of welded steel construction to permit low overall weight. With the pinion shaft equipped with SKF bearings, the load-bearings are a high-capacity roller type while the hold-down bearings utilize the ball design.

▪ D & B Pumping Equipment

A general line of pumping equipment, including both surface and subsurface accessories, together with sucker rods and pull rods, is exhibited by D & B Pump and Supply Company in Booth 332.

Produced from the highest grade alloy steel and manufactured under the strictest precision standards dictated by the API, each D & B part is interchangeable while the pump as a whole is well-known for its excellent service record in the field.

▪ Youngstown Tubular Goods

The parent company of The Continental Supply Company, Youngstown Sheet & Tube Company is exhibiting samples of all types of tubular goods and couplings in Booth 328 and 330. A special feature of the Youngstown tubular display will be Hydril drill pipe and Youngstown Speed-tite casing, both pioneered and developed by Youngstown engineers.

▪ Youngstown Steel Unions

Youngstown Steel Products Company, subsidiary of Youngstown Sheet & Tube Company, has on display in conjunction with the parent company all types of forged steel unions, including the recently inaugurated handlebar type union. Of exceptional strong construction to resist making up and breaking down countless times, Youngstown forged steel unions are furnished either with brass or steel seats machined to a mirror-like finish. Black or udylite cadmium treatment of these unions affords protection against sparks or corrosion—both constant hazards in the field against which no measure of prevention can be construed as an unnecessary safeguard.

▪ *Westcott Valves*

Samples and parts of gate valves, drilling valves, check valves, choke valves and christmas tree fittings comprises Westcott Valve Company's exhibit in Booth 428. All Westcott products are produced in keeping with the latest design and metallurgical practice, using only high grade materials.

▪ *Broderick & Bascom Wire Rope*

In conjunction with the above exhibit in Booth 428, Broderick & Bascom is showing samples of oil industry wire rope. In addition to an assorted display of samples shown, factory methods will be explained.

▪ *Mechanical Rubber Company Belting*

Samples of both Rough Rider Cord and Rough Rider Raw Edge transmission belting will be exhibited in Booth 430, occupied by Mechanical Rubber Company. Both these tyes of belting were designed especially for oilfield service, having a cord-ply construction which permits a neat and correct adjustment of plies to the required weight and strength, with minimum elongation under enormous shock loads.

An interesting part of Mechanical Rubber Company's display will be its samples of Super Rough Rider rotary hose, manufactured to resist abrasion due to its multiple plies of strong cotton duck, flat braided steel wire and durable live rubber. Also, Rough Rider slush pump suction hose, Hel-Fi steam hose and C. S. CO. Packing are on display here.

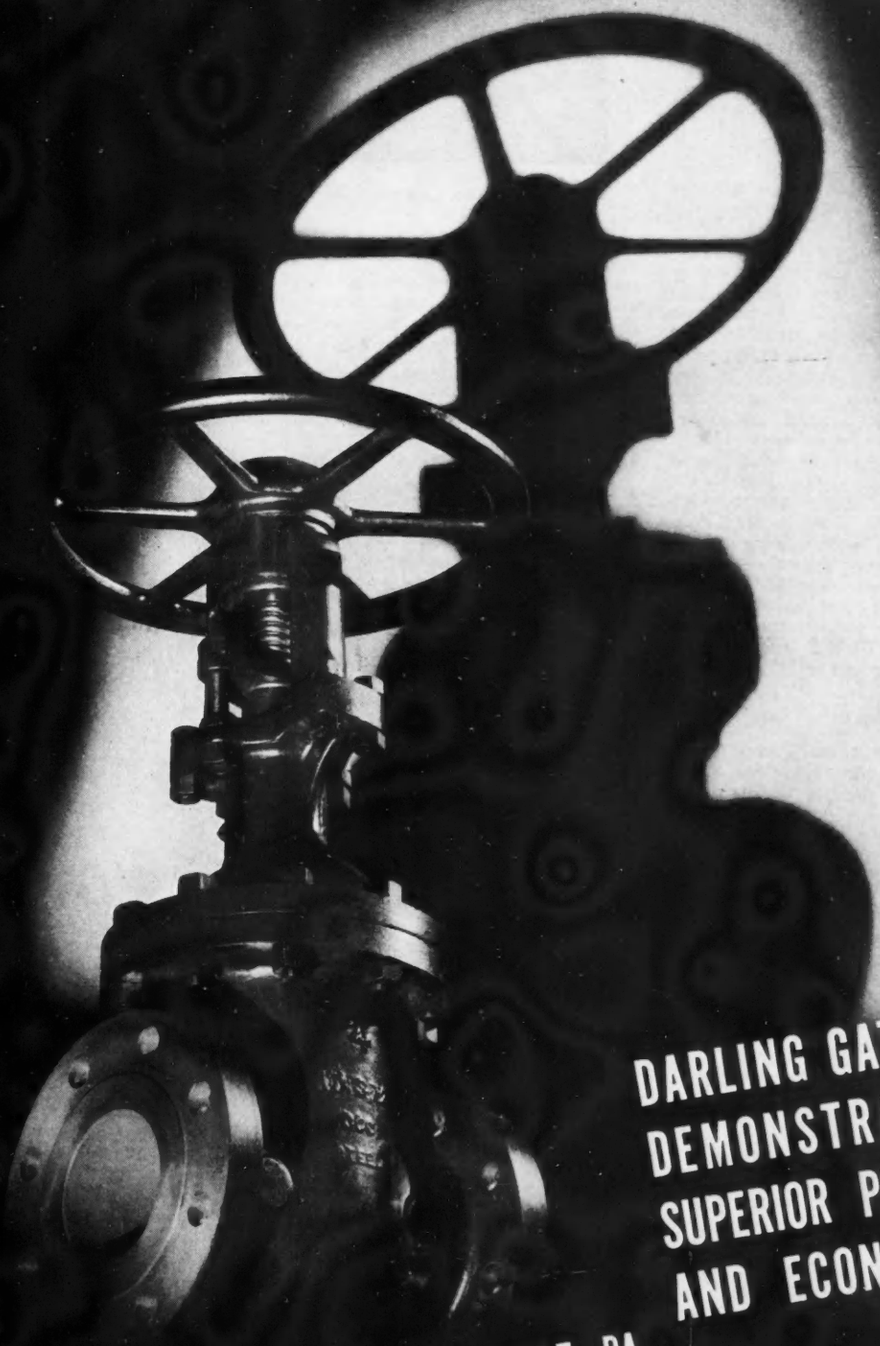
▪ *New Bedford Cordage*

Made from only the highest grade selected manila fiber and manufactured with precision experience obtained only by skilled rope makers, New Bedford Cordage has been distributed exclusively by Continental to the oil industry since the company was first organized in 1912.

A large number of sizes of manila rope, together with drilling cables, bull ropes and catlines are exhibited by the company in Booth 430.

DARLING

GATE VALVES



DARLING GATE VALVES DEMONSTRATE THEIR SUPERIOR PERFORMANCE AND ECONOMIES . . . .

DARLING VALVE & MFG. CO., WILLIAMSPORT, PA.

REPRESENTATIVES IN
NEW YORK, OKLAHOMA CITY, HOUSTON

MID-CONTINENT DISTRIBUTORS
INTERNATIONAL SUPPLY CO.

CALIFORNIA DISTRIBUTORS
MOORLANE COMPANY
HICKEY PIPE & SUPPLY CO., 3375 EAST SLAUSON AVE., LOS ANGELES, CALIF.

Frick-Reid Supply Corporation

▪ ***Drilling & Pumping Machinery***

Frick-Reid Supply Corporation, Tulsa, has a large and interesting exhibit of drilling and pumping equipment in Booths 350-352-354-356 and 451-453-455-457.

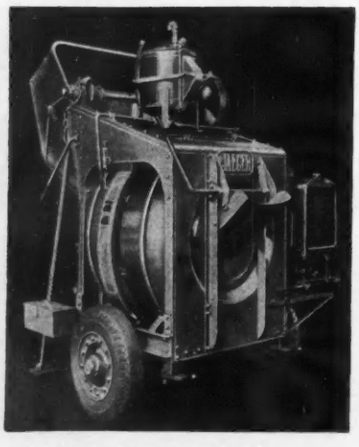
The Jaeger Machine Company

▪ ***Concrete Mixer***

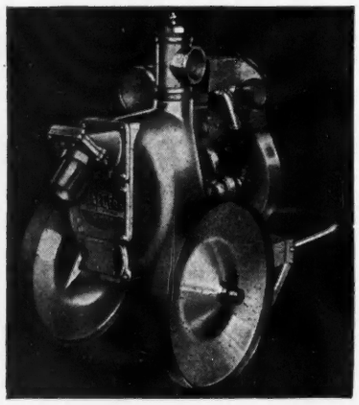
Greater portability and higher speed production in spite of the sticky quality of modern dry mixes are characteristics of the latest type Speed King concrete mixer exhibited by The Jaeger Machine Company, Columbus, Ohio, and its representative Browning-Ferris Machinery Company, Houston. Two-wheel pneumatic tired trucks with Timken Bearings and spring shock absorbers permit trailing the machine at high speeds, and make it easy to move over soft ground and to spot into position. The drum, of 7 cubic feet capacity in mixed concrete, runs on machined steel tracks and is equipped with forced bucket action discharge to match the higher loading speed of the patented Skip Shaker loader. Man-Ten Alloy Steel construction is used to lighten weight with increased strength and resistance to abrasive action of harsh concrete. The end discharge design of this mixer, which Jaeger originated, permits setting up the machine in narrow space and pouring direct into forms or chute.

▪ ***Centrifugal Pump***

This 3-inch "Sure-Prime" Pump, manufactured by The Jaeger Machine Company, Columbus, Ohio, is conservatively rated at 20,000 gallons per hour, primes 100 percent automatically and is extremely compact and portable for field service. Pump and engine are mounted integrally. The impeller, which is the only moving part, is on Timken Bearings with special seal which eliminates shaft packing. Shell is of close-grained semi-steel casting to withstand high pressures and the abrasive action of dirty water which is easily handled without clogging due to the patented self-cleaning design of the volute



Jaeger Speed King Mixer



3-P Sure-Prime Centrifugal Pump

and open type of the impeller. This is said to be the fastest priming fully automatic type of pump made; will prime at lifts even above 25 feet and, once primed, will hold its prime indefinitely.

Marmon-Herrington Company, Inc.

▪ ***Tractor***

Marmon-Herrington Company, Inc., of Indianapolis, Ind., exhibit is in the booth of Transportation Equipment Company, distributor for the Houston, Texas, territory.

The company has chosen the exposition to show for the first time its new Marmon-Herrington Model TA-30 Tractor, said to be one of the greatest steps forward in commercial track-laying tractor designs in the last 20 years.

Especially adaptable to operating conditions in the southwestern states, the new tractor is capable of sustained road speeds of 25 miles an hour and better and has complete maneuverability. Its speed capacity, proved in test runs of 1000 miles each, is certified by the American Automobile Association.

Simplicity of design, and ease of operation, plus a new track design, are outstanding features of the new unit. The special track combines the strength of steel and the cushioning effect of rubber to allow smooth, quiet operation, free of clatter and vibration, and remarkable track mileage.

Extensive use of automobile parts in the new tractor assures easy servicing of the unit, and all parts, including the engine, are quickly accessible. The tractor hull is water-tight and the unit will operate in more than 36 inches of water. The center of gravity of the new model is so low the tractor can be turned safely on any hill it will climb. It can be pivot-turned safely, either from a standing position or from its highest forward speed.

▪ ***Trucks***

Besides the tractor, Marmon-Herrington's all-wheel-drive production will be represented by a Marmon-Herrington Model C40-6 (a six-wheel-drive) and a Model 65-6, all-wheel-drive Ford V-8 with six wheels driving, with a 154-inch wheel base, and a Marmon-Herrington all-wheel-drive Ford V-8 St. Paul Road Patrol. The company's complete, cutaway mechanical display also will be shown in the booth.

Hydril Company

▪ ***Blowout Preventer***

A full size automatic blowout preventer, set up so that its operation can be closely observed, is the central feature of the Hydril Company display at the Oil-World Exposition. The use of compressed air as an actuating means, enables the exhibitor to simulate the operation of the blowout preventer on a well where gas pressure is present.

▪ ***Tubular Goods***

In addition to the automatic blowout preventer display, the Hydril Company is showing cutaway sections of its various drill pipe joints, including the internal

Hydril Automatic Blowout Preventer, With Octagon Kelly

flush, external flush, and internal and external upset types, and its joints for casing and tubing embracing the external upset joint (also known as speed type joint), and the internal and external flush joint for both casing and tubing. An ingenious operating mechanism shows the screwing and unscrewing action of these joints in such a manner that the contact of the male and female threads may be closely observed.

▪ ***Pressure Drilling***

The display which will occupy five booths, 1126, 1227, 1229, 1231, and 1233, also includes a pictorial representation of the Hydril system of Controlled Pressure Completion. The exhibit shows in detail the application of all the equipment involved in controlled pressure completion drilling work.

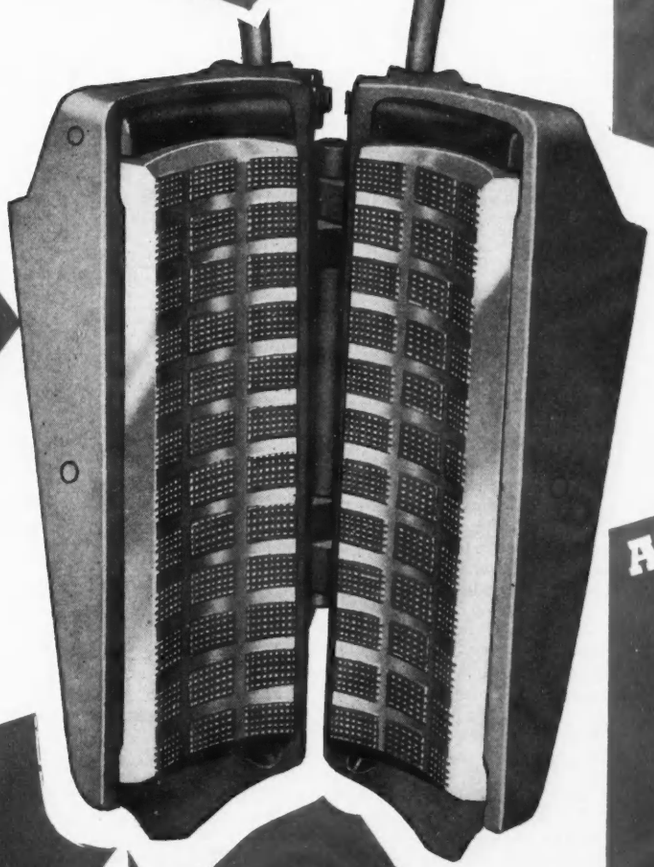
▪ ***Other Products***

A wide variety of back pressure valves, drill pipe and casing plugs, safety joints, pulling-in equipment and other control mechanism which constitute the Hydril line of equipment also are shown.

THE STAR OF THE HOUSTON OIL SHOW
OCTOBER 11-16, 1937

BAASH-ROSS
TOOL COMPANY

SELF-ALIGNING Rotary Slips



SEE THEM IN BOOTHS 120 and 221
(Norvell-Wilder Section)

AUTOMATICALLY
- Maintain a full length, non-crushing grip on the pipe.
- Compensate for wear of the master bushings.
- Adjust themselves to the pipe in any position.

BAASH-ROSS
TOOL COMPANY

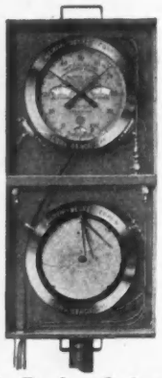
SAFE, MODERN OIL TOOLS
ON DISPLAY IN BOOTHS, 120, 221, 1037, 1038

Martin-Decker Corporation

Martin-Decker Corporation's exhibit is in Booths 130 and 231. The following instruments will be exhibited.

▪ *Quintuplex Drilling Control Instrument*

This instrument combines five important gauges in one case right in front of the driller's eye, and keeps a written 24-hour record of drilling progress. A refinement on the Quintuplex, introduced this year, is the new mud



Martin-Decker Quintuplex

element that gives Vernier readings of low pressures and still has ample capacity to cover the high pressures. The first 1500 pounds of pressure is spread over 240 degrees of dial travel, while from 1500 to 3000 pounds the gauge hand is automatically retarded to compress this range on only 60 degrees. Thus the widespread low pressure range gives extreme fidelity to the slight pressure changes encountered in ordinary drilling, and the compressed high pressure range gives ample capacity to cover the peak pressures reached when cementing, breaking circulation, etc.

▪ *Individual Type Mud Pump Gauge*

This instrument also incorporates the new Vernier type double range gauge that has been recently developed by Martin-Decker engineers. By spreading the first 1500 pounds of gauge readings over 240 degrees of dial travel and compressing the last 1500 pounds on only 60 degrees, the gauge is able to give high fidelity to the small pressure changes on ordinary drilling and have ample capacity for the occasional peaks reached when cementing, breaking circulation, etc. This new development has been installed on both the indicating and the recording elements of the mud pump unit.

▪ *Measuring Line Weight Indicator*

This instrument handles any line up to 3/16 inch diameter, and by means of ingenious roller contactors is able to give accurate readings whether the line is moving or at rest. It has a sylphon bellows which, unlike a piston, will not leak or stick. The sylphon is vacuum loaded at the factory with exactly the right amount of non-corrosive, non-freezing fluid, and is highly sensitive to the small pressure changes encountered in this kind of work.

▪ *Clipper Type Weight Indicator*

This instrument offers compactness, portability and all around efficiency. It weighs only 47 pounds complete, and has 10 interchangeable dials nested within the case which enables it to read both in pounds and points for any string-up with any conventional size line. It has a regular weight indicating

Martin-Decker Clipper

hand and a Vernier hand six times as sensitive that gives extreme accuracy on all types of delicate operations such as fishing, lightweight drilling, milling, etc. The Clipper is completely self-contained, requires no filling or pumping up and is water-proof, tamper-proof, and fully temperature compensated.

▪ *Unitized Mud Pump Gauge*

This is a brand new instrument developed by Martin-Decker engineers that will have its initial showing at the oil show. It is a companion instrument to the Clipper and fills the need for a highly portable mud pressure gauge capable of maintaining test gauge accuracy through long years of service. Combined in a single unit are a "double range" type gauge that gives Vernier readings of the low pressures with ample capacity to cover peak pressures; a diaphragm unit that prevents the drilling fluid from ever contacting the gauge mechanism; and an adjustable pulsation damper that smooths out destructive fluid gauges, yet allows instant sensitivity to actual pressure changes. It is constructed of non- corrosive metals, tested to a pressure of 5000 pounds. It is completely self-contained, requiring no pumping up, no filling, and is completely water-proof, tamper-proof, and temperature compensated. Throughout, it is engineered for laboratory accuracy under the rigorous use encountered in the oil fields.

▪ *Other Products*

Other Martin-Decker instruments that will also be exhibited include: The pump dynamometer, pull rod dynamometer, cable tension indicator, and automatic recording cement pump gauge.

Lone Star Cement Corporation

▪ *Cement*

Lone Star Cement Corporation, Dallas, Texas, is located in space 748 on Aisle 7 in the main building.

For some time the company has been conducting laboratory and field research on the use of portland cement in the cementing of oil well casing, reconditioning wells, plug back and squeeze jobs. Its exhibit is built around some of the results obtained from this work.

Sullivan Machinery Company

Motorized drills for core holes, seismograph shot holes, shallow production and deep structure drilling are exhibited by Sullivan Machinery Company, Michigan City, Indiana, in addition to a pumphead display.

▪ *Drilling Machines*

The drill exhibit, each machine prepared for mechanical demonstration, consists of four complete units—three truck mounted and one on twelve wheel trailer. The machines are:

The Sullivan No. 36 Drill, a light seismograph shot hole machine, truck mounted.

The Sullivan No. 37 Drill, a heavy-duty seismograph and shallow structure testing drill, truck mounted.

The Sullivan No. 38 Drill, high-speed structure testing unit, truck mounted.

The Sullivan No. 51 Drill, for shallow production, for repressuring and for very deep structure drilling, twelve wheel trailer mounted.

▪ *Compressors and Drills*

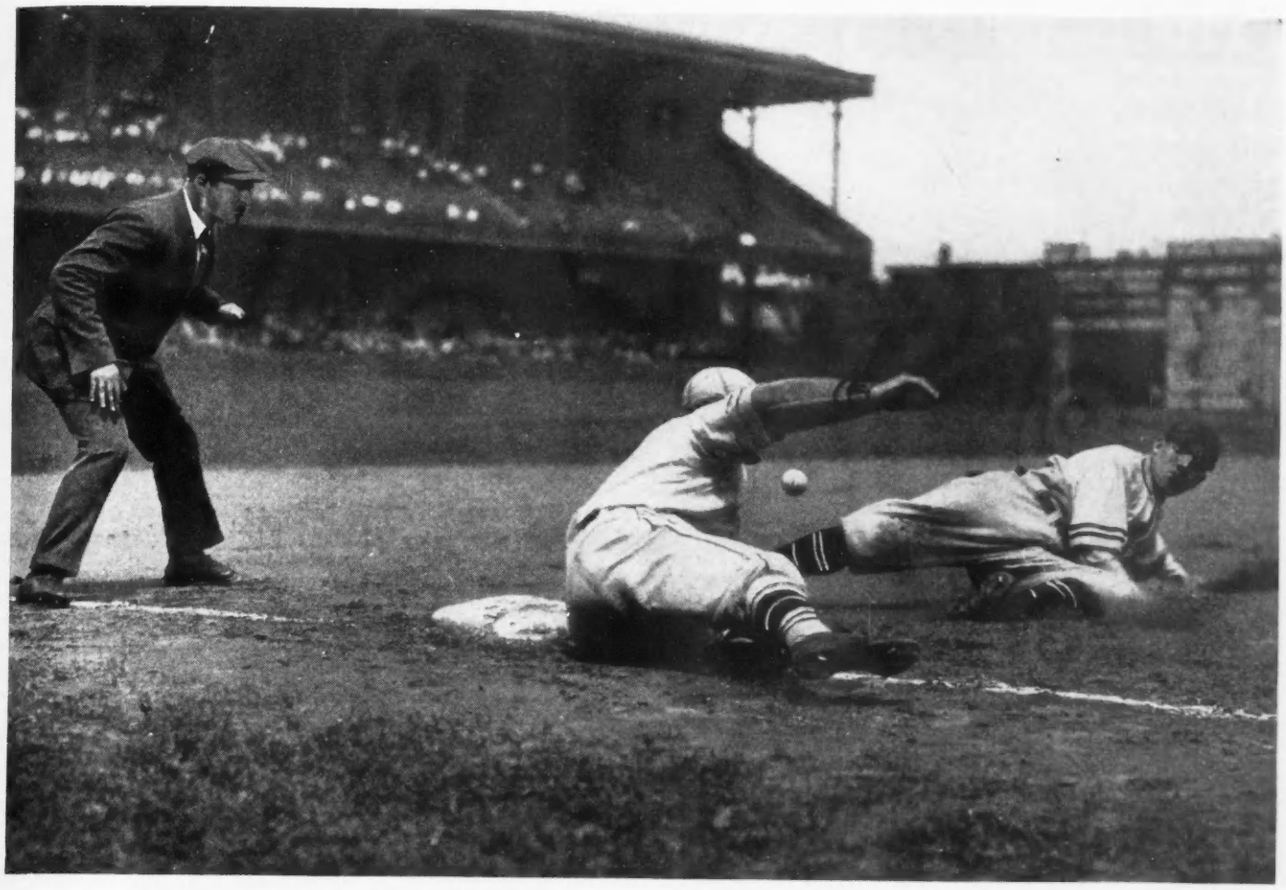
In addition to the drills and pumphead exhibits, Sullivan Machinery Company is showing one of the latest two-stage portable compressors and pneumatic rock drills, spaders, concrete breakers and detachable bits.

▪ *Sullivan Pumpheads*

The latest type 15-foot stroke pumphead mounted in a 136-foot derrick is exhibited by Sullivan Machinery Company, and operated to simulate actual pumping conditions. Power is supplied by a new semi-portable gas engine driven compressor.

Visitors will be able to study these distinctive characteristics of the Sullivan pumphead: the three-fold sucker rod protection, consisting of the long, straight pull, polished rod stroke; the giant shock absorber; the definite limit on the strength of the up-stroke pull; manual operation of the head, to jar loose a stuck plunger; the ease with which the pumping speed can be changed; the fast up-stroke with slow down-stroke, or the slow up-stroke with the fast down-stroke; the adequate lifting power regardless of speed; the freedom from counterbalancing problems; the ease with which wells equipped with Sullivan pumpheads can be weighed and tested; and the inherent simplicity of an installation.

The pumphead used in this demonstration has been designed to operate sucker rods up to depths of 9000 feet. Eight sizes are available, covering all well pumping conditions.



SAFE

Safety by a split second is O. K. in some places. Making it by the "skin of your teeth" may win a championship, but the safety from grief in Oil Country tubular service should be safety with a lot to spare—and old-timers know it's "there" in Wheeling Casing, Tubing and Line Pipe.

WHEELING STEEL CORPORATION
WHEELING, WEST VIRGINIA

WHEELING STEEL

IT'S WHEELING STEEL

Byron Jackson Company, Tool Division

▪ ***Drilling and Production Tools***

The complete line of drilling and production tools of the Byron Jackson Company Tool Division is on exhibit, which is comprised of full sized tools, models and demonstrations.

Among the items displayed are the following: BJ Triplex hook, in three sizes; the line of BJ tubing and rod hooks; the BJ slip casing elevator with side-door feature; the Surestop and the Shortype C tubing catchers; the rugged Type A center latch elevator, with fully heat-treated body; and many other products for average depth drilling and for the deepest tests wells.

Byron Jackson Company, Pump Division

▪ ***Pumps***

Byron Jackson Company's Pump Division exhibit is featured by the new Submersible, hot oil charging and Hydropress pumps.

The Submersible consists of a direct-connected, close-coupled, vertical electric motor and pump, the motor being enclosed in a steel housing and completely submerged in the fluid being pumped. The centrifugal, or deep well type pump is mounted above the motor. Many proved advantages are thus secured, viz., by eliminating the conventional long shaft from pump to a surface driver, all difficulties of misalignment and excessive bearing wear are avoided; power costs are materially reduced; higher efficiencies are secured; and since the motor case is filled with high dielectric oil and cooled by the fluid being pumped, long life and trouble-free operation are assured.

As the use of the Polymerization Process increases, the Byron Jackson Double Case Hot Oil Charging Pump is found to be the ideal pump for such service. Recent installations in polymerization service—including a 19-stage unit—are proving the efficiency of design and construction of this type of pump. A 10-stage pump will be exhibited at the Houston Oil Show.

Another interesting pump on display will be the Byron Jackson Hydropress now extensively used in refinery service, and increasing in popularity for water-flooding, or re-pressuring service.

Lufkin Foundry & Machine Company

▪ ***Pumping Units***

Lufkin Foundry & Machine Company, Lufkin, Texas, is featuring its long-stroke pumping units at the Houston oil show. This rugged and compact type of unit is said to offer many practical advantages for long stroke pumping, and particularly for installation on derrick floors or over water where foundation expense is a consideration.

In general the chief characteristics of the Lufkin long-stroke unit are: wide, deep base making the unit completely self-contained; four legged samson posts of most rigid design; well-designed walking beam with center line bearing arrangement and with double heads at each end of the beam; absolutely straight line pumping motion; strokes of 40 inches, 60 inches, 80 inches and 120 inches, with speeds from 10 to 20 strokes per minute.

Lufkin Long-Stroke Pump

These units are equipped with the regular Lufkin No. 41 or No. 51 double reduction gear, and weigh approximately 30,000 pounds.

Gulf Engineers, Inc.

▪ ***Keil Shale Shakers***

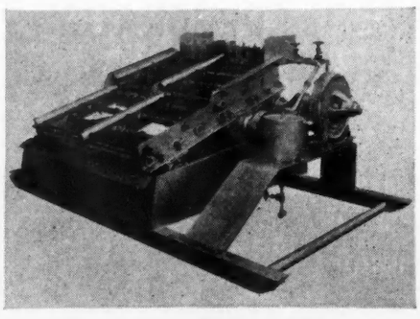
Featured in the Gulf Engineers, Inc., of Houston, exhibit is the Keil shale shaker, for which are claimed such special advantages as step deck construction, greater mud handling capacity and four section screen cloths, permitting economical replacement of screen cloth, when necessary. All resilient parts are made of rubber, there being no loose moving cams or springs.

▪ ***Chiksan Rotary Hose and Joints***

The full line of Chicksan all-steel rotary drilling hose, dock loading hose, ball bearing swivel joints, and mud gun joints will be exhibited, as well as the new Chiksan circulating head, or "poor boy swivel."

▪ ***Slush Pump Specialties***

Varco hardened and ground slush pump liners and piston rods claiming fine materials and exceptional service are shown, as well as the Lamb solid slush pump piston. The Volz valve motion for slush pumps for duplex steam pumps eliminates water hammer, lowers steam consumption, substitutes a constant movement of the steam valve instead of the pulsation given by the ordinary type rocker brackets.



Keil Shale Shaker

Republic Steel Corporation

▪ ***Casings***

Republic Steel Corporation, Cleveland, Ohio, is exhibiting in Booths 745 and 755 several types of casing and joints featuring its new heat treated casing, which insures greater setting depths for lighter weights yet maintaining the present safety factors. Included in the display are belled-end casing for welding in the hole and belled-end joints, both welded and not welded.

Republic Steel Corporation also is showing oil country products fabricated from Republic Agathon alloy steels.

Packing Engineering Corporation

Packing Engineering Corporation, Cranford, New Jersey, is featuring items containing new and unusual characteristics developed to give better packing service against particularly severe conditions. Some items on display at its booth, 148, follow:

Ace-O-Pax Packing

Ace-o-Pax packing, which is an improved coil form in both square and round cross sections. A complete line of non-graphitic styles whose use eliminates pitting of high carbon steel moving members in the presence of electrolytes.

Flexible Packing Hooks that save time and barked knuckles and reach around corners.

Permac Jointing Compound for making a metal-to-metal joint. It holds as well between pitted, warped and rough flanges as between smooth surfaces.

Two flexible metallic packings of improved construction.

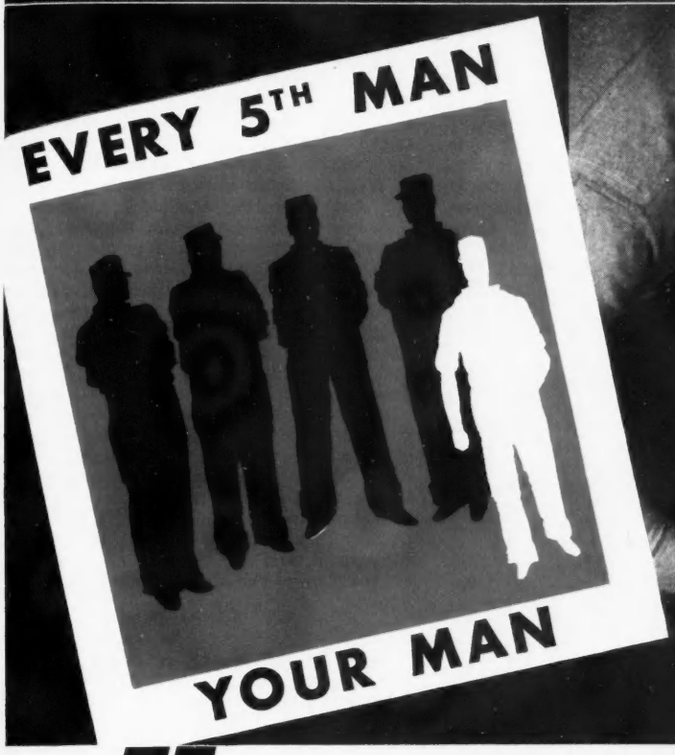
A new ring packing impervious to petroleum, of particular value on plungers of outside packed pipe line pumps.

A braided packing for general oil and distillate use designed especially for use in contact with high carbon alloy steels.

A device for keeping sand out of the stuffing boxes of outside packed pipe line pumps.

Polish rod ring sets.

Increase your profits with J&L STEEL



Gauging taper of threads on J&L Seamless Casing with automatic micrometer.

Your guarantee

that J&L Seamless Tubular Products meet your exacting requirements

When you buy J&L Seamless Tubular Products, you get the maximum in service. Long life, dependable strength, exact dimensions are assured by exhaustive inspection at every stage of manufacture.

Every fifth man in the Jones & Laughlin Seamless Tube Department works for you . . . in your interests . . . as if he were on your payroll. This man . . . *your man* . . . makes complete chemical and physical tests, compares wall and thread dimensions to accurate standards by precision methods, checks every length under heavy hydrostatic pressure.

This constant checking and inspecting is your *guarantee* that J&L Seamless Oil Country Goods are *the best that can be made.* With J&L Seamless, you get the maximum in long life . . . true threads . . . dependable wall strength.

Cut your drilling and setting time . . . save money through longer life and extra service . . . get lasting satisfaction. Buy Jones & Laughlin Seamless for all your needs.

JONES & LAUGHLIN STEEL CORPORATION

PITTSBURGH, PENNSYLVANIA

MAKERS OF HIGH QUALITY IRON AND STEEL PRODUCTS SINCE 1850

J&L PIPE

J&L SEAMLESS

DRILL PIPE · CASING · TUBING · LINE PIPE

Visit the Jones & Laughlin Exhibit at the Oil World Exposition

Houston, Texas
October 11 to 16

This valuable handbook—OC3—gives complete specifications on J&L Seamless Tubular Products . . . contains valuable designing data. Write for your copy today, on your letterhead.

Fred E. Cooper and Allis-Chalmers Manufacturing Company

▪ ***Tractors, Winches and Power Engines***

Fred E. Cooper, Tulsa, exclusive distributor for Allis-Chalmers well servicing equipment and power engines, is exhibiting high speed winch tractors, skid winches and power engines.

Allis-Chalmers Winch Tractor

On exhibit are the following units: "U-E" single-drum tractor with rotary attachment; "UEL" single-drum skid with rotary attachment; "U-E" double-drum tractor; "UM" double-drum tractor; "UM" single-drum tractor; "L-90" power unit; "U-40" power unit; "E-60" power unit with heavy duty clutch shaft; and a deepest test wells.

The Parkersburg Rig & Reel Company

The Parkersburg Rig & Reel Company, Parkersburg, West Virginia, is displaying its three different lines of oil field equipment, which include tanks and accessory items, derricks and accessory items, and pumping units. One of the features of the exhibit will be the new hydronumatic pumping unit which has only recently completed its six months field test and is being introduced to the industry for the first time.

▪ ***Hydronumatic Pumping Unit***

A new type of pumping unit using a combination hydraulic and pneumatic counterbalance that can be operated with either a long slow stroke or a short fast stroke. Its versatility enables it to handle almost every possible well condition.

▪ ***54-B Pumping Unit***

A recently designed 54-inch stroke pumping unit built to handle a variety of conditions. It is the twin crank type and employs either the beam or crank type counterbalance or a combination of both. The well load capacity of the standard unit is 17,400 pounds.

▪ ***54-S Pumping Unit***

This unit is the single crank type with a 54-inch stroke. It also has been designed to use either beam or crank type counterbalance. A wheel type crank that permits counterweights to be mounted for lag or lead at any point within 360° is also available. The well load capacity of the standard unit is 17,400 pounds.

▪ ***Derrick & Accessory Equipment***

Included in this display will be a 136-foot derrick, pump house landing platform, double board platform, quadruple safety platform, crown safetype platform, and ladder landing platform. A new type of substructure the "HB" will also be shown, complete with grillage, engine support, pipe ramp, pipe rack, loading ramp, engine support platforms and steel stairways. This section of the Parkersburg display will offer for operators who are interested in all-steel drilling outfits a complete review of the latest advancements in this type of equipment. It will also provide for Mid-Continent and Gulf Coast operators an opportunity to view the not so familiar "California Type" derrick accessories.

▪ ***Bolted Tanks and Walkway and Stairway***

The new type "E" walkway and stairway will be featured in the Parkersburg bolted tank display. The design of the Type "E" offers several important advancements and will prove exceptionally interesting to every user of similar equipment.

The Kennedy Valve Manufacturing Company

▪ ***Valves***

The Kennedy Valve Manufacturing Company has space in the Norvell Wilder Supply Company exhibit, and is showing the following types of valves:

Standard iron-body double-disc gate valve with screwed and flanged ends and non-rising stem.

Standard iron-body wedge gate valve with screwed ends and non-rising stem.

Standard iron-body wedge gate valve with outside screw and yoke.

A 400-pound test iron-body gate valve with flanged ends and outside screw and yoke.

A 700-pound test iron-body gate valve with screwed and flanged ends and non-rising stem.

A 1600-pound test iron-body gate valve with screwed and flanged ends and non-rising stem.

Bronze valves of various types and for various pressures.

Standard malleable iron screwed pipe fittings of various types.

Standard bronze screwed fittings of various types.

Standard cast-iron flanged fittings of various types.

Trinity Portland Cement Company

▪ ***Cements***

Trinity Portland Cement Company, Republic Bank Building, Dallas, Texas, has on exhibit its various kinds of cements, including Standard Portland, High Early Strength, Inferno, Fibre and Mix Masonry. Included in the exhibit also are two pieces of apparatus which serve to emphasize the close control which the company exercises in the manufacture of its products.

The first instrument shown is a Christian Becker No. 15, Chainomatic Balance with a notched beam. This balance is of the latest type and is equipped with notched beam with ten intervals, each representing 100 milligram, and a special rider and rider carrier, which together with the Chainomatic feature eliminates the necessity of any fractional weights below a denomination of one gram. This balance has a capacity of 200 grams and a sensitivity of one-twentieth milligram at full load or almost one two-millionth of a pound. The instrument is used for analytical work in the laboratory of the company to determine within a fraction of a percent the various elements which go to make up the finished cement.

Another item on display is the Comparator, which has been developed by the Portland Cement Association for the measurement of the expansion of 1 x 1 x 11¼ inches cement specimens. The lengths of these specimens are taken with the Comparator and then recorded. After that, the specimens are steamed for several hours at a pressure of 300 pounds per square inch at a temperature of 420° F. These specimens are then allowed to cool and their measurements again taken. The difference between this latter measurement and the one first taken represents the expansion of the cement. The Comparator is accurate to one ten-thousandth of an inch, and the slightest expansion or contraction of the specimens can be easily detected.

American Roller Bearing Company

▪ ***Roller Bearings***

American Roller Bearing Company, Pittsburgh, is displaying a complete line of heavy-duty roller bearings at the Oil-World Exposition.

Designed and developed specifically for heavy-duty oil-field service, American roller bearings are extensively used in crown and traveling blocks, draw works, winches, swivels, and various other types of drilling and pumping equipment.

Sealed Power Corporation

▪ ***Piston Rings***

Sealed Power Corporation, of Muskegon, Mich., has on exhibit a complete line of Sealed Power piston rings for industrial uses. Included in the exhibit are samples of Sealed Power plain compression rings, the Joint Seal compression ring designed for use in worn equipment so that the opening at the joint is completely sealed off both across the face of the ring as well as against leakage from behind the ring.

Corrosion resisting rings in any type desired are shown, including those resistant to the action of "sour" gases or oils; and which are also advised for use where lubrication is scanty or below normal, such as with gas compressors or the upper rings on Diesel pistons, to assure minimum liner wear, under high temperatures and poor lubrication.

Sealed Power Dubltite rings are shown also for those who require an effective two-piece ring.

For the proper control of oil, two types or oil rings are shown, the Bevel and Grooved Oil Scraper ring, which is designed to maintain, as the ring wears, proper scraper action on the cylinder wall for oil control; and the Super Drainoil Ventilated Oil Control ring, designed to control abnormal oil conditions most effectively.

Walworth Company

Walworth Company, New York, is occupying booths 658, 660, 759 and 761, at the far end of Aisle 7. Its exhibit shows the Walworth line of valves, fittings, pipe and tools.

▪ *Valves*

The new Walworth valve, known as Figure 225P, which has a seat and disc of high crome, non-corrosive stainless steel, heat-treated to a minimum Brinell hardness of 500, is on display. This valve is manufactured in sizes from ¼-inch to 2 inches.

Also on exhibit are mud line valves, Figure 85 flow line drilling gate valves, and lubricated plug valves.

▪ *Other Products*

Walworth C.N.I. flanged pipe, Walco pipe wrenches and Walworth genuine Stillson wrenches are displayed also.

Mid-Continent Supply Company

Mid-Continent Supply Company, with general offices at Fort Worth, Texas, is located in space 1001 on the outside and space 202 on the inside of the building. The following products are on display in the Mid-Continent booths:

▪ *Cummins Diesel Engines*

The Cummins full Diesel cold-starting engines, with their exclusive patented fuel system, are featured by the company.

The exhibit of Diesel engines includes the following types:

Two Model LI-600 Cummins cold-starting full Diesel 6-cylinder engines, which develop 200 horsepower at 800 revolutions per minute, and 250 horsepower each at 1000 revolutions per minute. These are in operation powering a Wilson Atlas rotary drilling rig.

Two Model LI-600 Cummins Diesels, of the same type as above, are used in powering an Allis-Chalmers M-2-800 rotary drilling rig.

The new Model "L" V-Type 12-cylinder Cummins cold-starting full Diesel engine is on exhibit also. It develops 400 horsepower at 800 revolutions, and 500 horsepower at 1000 revolutions per minute.

The Model HP-600 Cummins 6-cylinder full Diesel cold-starting power unit, which has 100 horsepower at 1500 revolutions and 150 horsepower at 1800 revolutions.

The Model AMR-6 Cummins 6-cylinder full Diesel cold-starting marine engine, which develops 85 horsepower at 1500 revolutions and 100 horsepower at 1800 revolutions.

A Model HP-600 Cummins full Diesel cold-starting engine powering a Wilson Giant model winch, which is used for servicing wells.

▪ *Emsco Rotary Brake Lining*

The Emsco engineered rotary brake lining on exhibit, is said to be different in principle, to control abrasive action, to prevent scoring without excessive drum wear and to deliver smooth, safe braking.

▪ *Naylor Spiral Casing and Pipe*

Another product on display in the Mid-Continent Supply Company booths is the Naylor spiral lock-seam surface casing and line pipe, which, with its exclusive lock-seam structure, provides strength with a minimum weight.

▪ *Automatic Relief Valves*

The Mid-Continent automatic relief valves are without seats or springs, and are for installation on main pipe lines or on pumps. They eliminate excessive pressures caused by surges or improper operation of gate valves.

▪ *Ludlow Gate Valves*

A number of Ludlow gate valves are on exhibit.

▪ *Electroloy Open Flow Check Valves and Machinery Replacements*

Electroloy open flow check valves and Electroloy machinery replacements, which are manufactured by The Locomotive Finished Material Company, Atchison, Kansas, are handled exclusively in the oil country by Mid-Continent Supply Company. Electroloy is a metal of long life. Steel valves and large steel equipment also are made by this manufacturer.

▪ *Bethlehem Sucker Rods*

On exhibit are A.P.I. normalized sucker rods, manufactured by Bethlehem Steel Company, which are designed to handle every type of pumping load.

▪ *Pacific Liner Pumps and Accessories*

The exhibit of Pacific oil well liner pumps and accessories feature precision equipment and "Moloy" pump liners designed especially to withstand severe pumping conditions, such as sand, high pressures, abrasion, corrosion, temperature and shock.

▪ *Multi-Seal Rivets*

These rivets are a brand new idea for repairing and construction of all kinds of equipment. The exhibit shows how the Multi-Seal rivet upsets its own sealing rivet head on the opposite side of the work, forms three distinct sealing surface of all metal, expands and compresses to fill in any irregular hole at the same time following the outside and inside surface irregularities or angles, such as corners or overlapping seams. They seal cracks from inside and outside with metal flow between, and will withstand over 3000 pounds internal pressure.

The Garlock Packing Company

▪ *Packing*

The Garlock Packing Company, Palmyra, New York, is displaying a line of mechanical packings generally used in the oil industry. Its line includes products for ordinary and high pressure, gas, oil, water and chemicals. Featured is the Garlock Chevron, a sealing element for reciprocating shafts, Fox type piston rings and metallic packing for extremely high pressures, and 7021 asbestos gasket sheet. In addition, there is a variety of other packings braided, woven and twisted from asbestos, duck, flax and metal.

The booth location is 519 and 521.

The International Nickel Company

▪ *Nickel Products*

The International Nickel Company, Incorporated, 67 Wall Street, New York City, is displaying some of its products used in the manufacture of oil field equipment.

Displayed against a background, which will show a diagramatic flow chart with electric lights of various colors flashing at the points on the diagram where the various nickel alloys are commonly employed, is a nickel steel sucker rod, nickel plated, as well as nickel alloy cast iron bubble caps and similar castings.

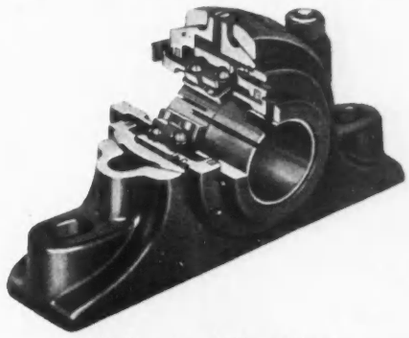
Included in the display are samples of pieces of nickel cast iron, Monel, pure nickel, Inconel, and a few pieces of nickel steel equipment.

Ahlberg Bearing Company

The Ahlberg Bearing Company, 3025 West 47th Street, Chicago, Illinois, is exhibiting various items of its products, including new ball bearing pillow blocks, ground bearings, and master ball bearings.

▪ *Ball Bearing Pillow Blocks*

According to the manufacturer, these ball bearing pillow blocks are entirely new in design, distinctive in appearance and contain patented features found only in "CJB" units. Notable among the various features is the new method of locking the bearings to the shaft. Three series are available for light, medium and heavy loads.



Ball Bearing Pillow Block

▪ *Ground Bearings*

The second item on display is the line of ground bearings, ball bearings which have been reconditioned to the higher standards of new bearing manufacture. The raceways of worn bearings are precision ground and lapped to provide new surfaces. New oversize balls and a new retainer are fitted, making the completed bearing the equal in service to that bearing when new. Ahlberg ground bearings are sold only on an exchange basis at a substantial saving to the user.

▪ *Master Ball Bearings*

The Master ball bearings exhibited are precision new bearings of the highest quality. They are made in standard single row, angular contact, double row, and self-aligning types. They are interchangeable with any other type of well known bearings.

Lycoming Manufacturing Company

▪ ***Engines***

Lycoming Manufacturing Company, Williamsport, Pennsylvania, has on display at Booths 1123-1125 various types of heavy duty natural gas engines for oil well pumping, and is prominently featuring a natural gas generator plant in operation. Complete in one unit, the plant requires no special foundation, the ordinary concrete floor being sufficient.

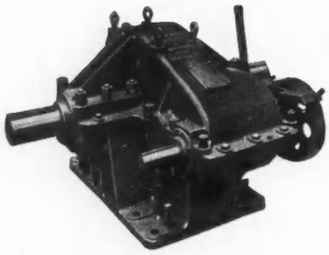
Among the different equipment on display is a six-cylinder gas engine, which is completely sectioned so that every moving part is visible.

The Lycoming engines have such features of design as zero lash self-adjusting valve lifters, cast iron engine base, cast iron radiator shell, tin plated pistons with steel baffles, sil-chrome exhaust valves with tungsten steel seat inserts, accurate governing with no external linkage, water temperature and oil pressure safety switches, all of which contribute to dependable service and long life in oil field service.

Foote Bros. Gear & Machine Corporation

▪ ***Pumping Speed Reducers***

Foote Bros. Gear & Machine Corporation, Chicago, manufacture a complete line of helical oil well pumping reducers, both the single and double reduction types. The single reduction type has a ratio of 10 to 1 and the double reduction 31.8 to 1. The single reduction units are suitable for use with slow speed engines with engine speed of about 400 revolutions per minute, and the double reduction for multiple cylinder engines with motor drives of maximum speed of approximately 1000 revolutions.

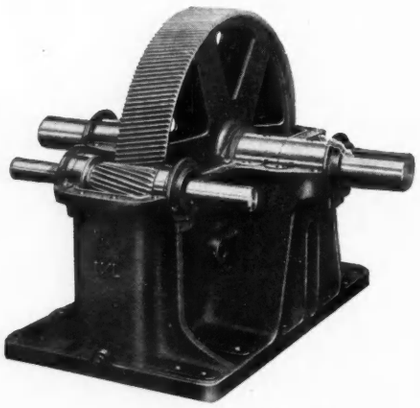


Foote Bros. 9 DO Gear Unit

The units range in size from 9 DO with a rating capacity of 3 horsepower at 20 strokes per minute up to the 30 SO single-reduction unit with an A.P.I. rating of 65 horsepower at 20 strokes per minute, suitable for pumping deepest wells.

The exhibit includes one of the smallest types, the 9 DO, and one of the largest, the 30 SO, to show the wide range of sizes and capacity available. Also included is one of the 30 horsepower double-reduction type 17 DO with cover removed and operating in oil bath to show internal construction and oil circulation system.

Some of the advantages claimed are: use of helical gears throughout the helix angles, heat-treated to 240 Brinell on the



Foote Bros. 30 SO Unit

gears and 280 Brinell on the pinions, assuring long life and greater strength than is possible with lower hardness gears. Plain babbitt lined bronze bearings are used on the slow speed shaft, which are exceptionally wide, distributing the bearing loads over a large area and confining the bearing pressure to 30-35 pounds per square inch.

Shafts are one size from end to end avoiding filletts and shoulders which result in concentration of stresses, and possible breakage due to fatigue.

The case of the reducer is crowded close against the hub of the gear eliminating internal bending strain in the shaft within the reducer case.

All bearings on the high and intermediate shaft are the same size and interchangeable.

The general specifications of the double-reduction type are given below:

All housings are of semi-steel heavily ribbed to resist deflection and reduce wear of gears and bearings. Extra heavy base with holes for foundation bolts of ample size, extra heavy studs with double nuts for fastening upper and lower sections, large air breather, inspection cover, eye bolts, dust and water excluder shields on all extended shafts—leveling screws in base and level gauge on top of upper section.

All gears are of the helical type. The high speed set of gearing has a helix angle of 15° and a pressure angle of 20°. The low speed set of gears has a helix angle of 10° and a pressure angle of 20°. All gears are lapped in to insure minimum back lash and uniform operation.

Gears are of cast steel, heat treated to 240-270 Brinell (36-40 scleroscope) before machining.

Pinions cut integral with their respective shafts and are of alloy steel forgings heat treated to 285-301 Brinell (42-45 scleroscope) before machining.

Crank shaft (low speed) is made of 1045 carbon steel forging, heat treated to 225-240 Brinell (32-36 scleroscope).

Lubrication is the splash gravity system —with large reservoir at bottom of housing—the oil from the gears rolls off from the hub of the gears and is fed by gravity down through the thrust washer to the oil troughs and then to the bearings. This lubrication system is equally effective regardless of speed or direction of operation — bayonet type — oil level gauge, large oil drain.

Sperry-Sun Well Surveying Company

▪ ***Directional Drilling***

Sperry-Sun Well Surveying Company, 1608 Walnut Street, Philadelphia, Pennsylvania, is showing at Booths 544-546 its various instruments for directional oil well drilling.

The exhibit includes the Syfo Clinograph, the H-K Inclinometer, the H-K directional magnetic Clinograph, the Surwel gyroscopic Clinograph, as well as several samples of cores which have been oriented by the new polarization method.

Jones & Laughlin Steel Corporation

▪ ***Tubular Products***

Jones & Laughlin Steel Corporation, Pittsburgh, Pennsylvania, is exhibiting its various tubular products, featuring a working model of an open hearth steel furnace. Built to scale in every detail, this unique model of an open hearth furnace depicts the actual operation of tapping a heat of steel from one of the J & L tilting furnaces. On either side of this model, illuminated murals will present the J & L story "Every Fifth Man Your Man," showing that out of every five men employed in the J & L seamless tube mills, one of these men is an inspector who constantly checks every feature during the manufacture of the pipe for accuracy to specification.

The display will include the following products: seamless drill pipe; casing tubing, and line pipe, with wall areas cut away to permit close examination of threads and wall thicknesses as well as contour and length of the upset formed on some of the tubular products; rolled seamless steel boiler tubes; standard pipe, both seamless and welded; oil containers and cans, as well as oil drums.

National Tank Company

▪ ***Separators***

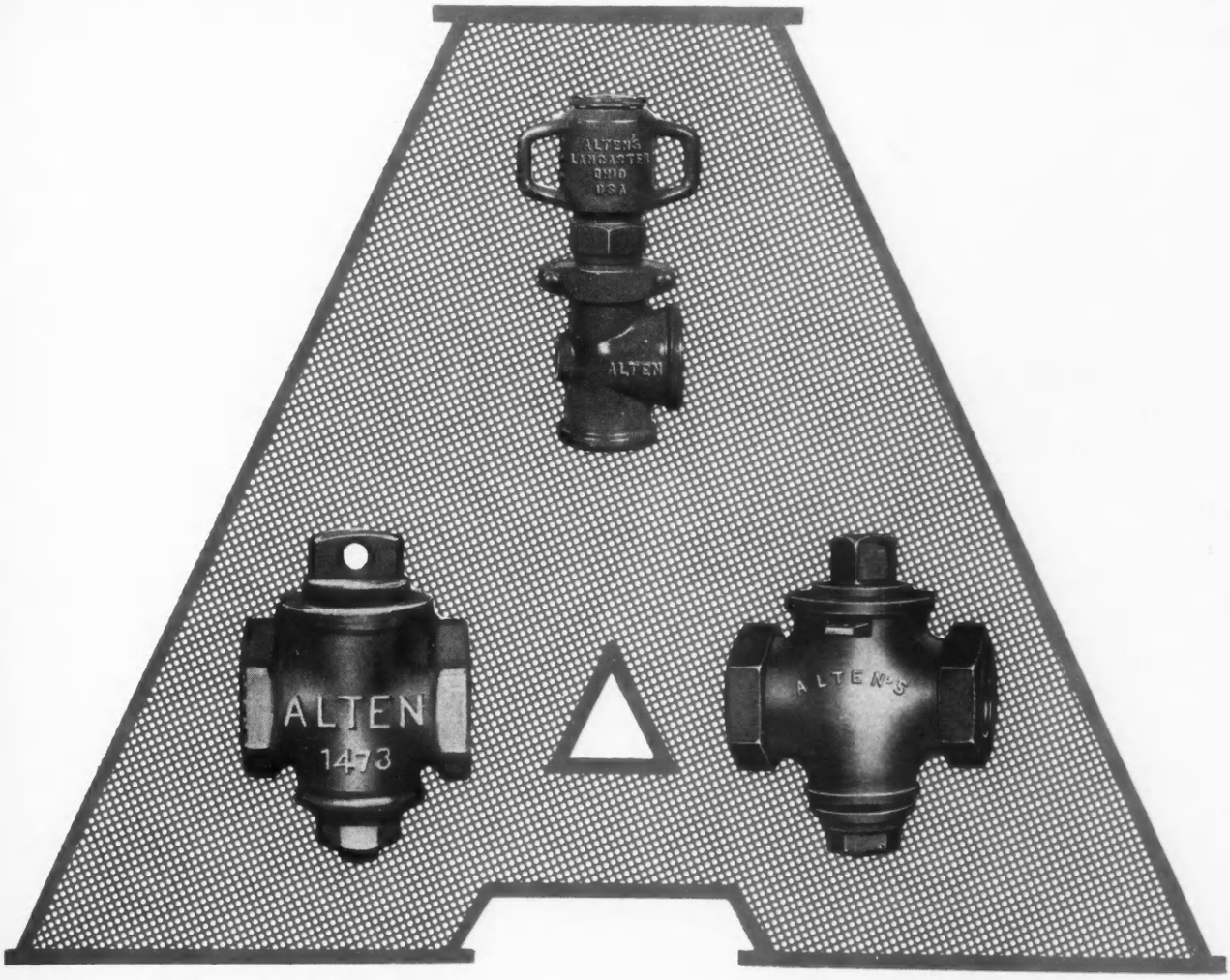
National Tank Company, Tulsa, Oklahoma, is displaying a complete line of its various products, featuring a working model of a National oil and gas separator.

▪ ***Tanks***

The exhibit includes a bolted tank with the following features: 24 x 44-inch extended manway with all cover bolts removable and replaceable from the outside; 8 x 22-inch gauge hatch which eliminates spilling of oil; an envelope gasket, preventing bottom seam leaks which are destructive to tank bottoms; anti-channel drain cover which eliminates cutting a drain into the bottom of the tank and again preventing bottom corrosion, and an equalizing valve that greatly retards deck corrosion, a vital point in the life of a tank.

▪ ***Couplings and Casing***

Further products on display are: Titeline couplings, which are the superior two-bolt pipe line couplings; spiral welded surface casing. In addition to these products, pictures are shown, disclosing the working operation of emulsion treaters.



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VISIT OUR BOOTH No. 1309 AT OIL-WORLD EXPOSITION

ALTEN'S

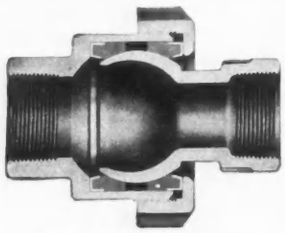
Foundry & Machine Works

Established in 1889 at LANCASTER, OHIO

Barco Manufacturing Company

▪ ***Flexible Ball Joints***

Barco Manufacturing Company, Chicago, is exhibiting its Barco flexible ball joint in the exhibit of M. N. Dannenbaum Company, Booth 516, and other types and classes of joints, including standard, extra heavy and cast steel for higher pressures.



Barco Flexible Joint

The Barco flexible ball joint is used for making steam line and mud pump connections around the rig. It is designed to take care of expansion, relieve stresses on flanges and otherwise simplify maintenance by relieving stresses due to expansion and strain on steam lines.

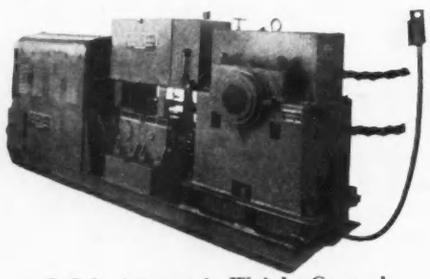
On high pressure mud lines the joints take care of misalignment and sharp loads.

Oil Country Specialties Company

▪ ***OCS Automatic Weight Control***

Oil Country Specialties Company, Coffeyville, Kansas, has the following on exhibit:

The OCS automatic weight control is an independent unit consisting of a V-8 power unit driving a self locking worm gear through a variable speed, reversible, hydraulic transmission. A sprocket on the worm gear shaft connects to the line shaft on the draw-works.



O.C.S. Automatic Weight Control

The mechanism in the control box, either manually or automatically, varies the speed or direction of the hydraulic transmission, which in turn controls the pipe through the self-locking worm gear and draw-works.

The distinct advantages claimed for the OCS automatic weight control are as follows: more speed, straighter hole, continuous feeding, more hole per bit, feeds up as well as down, helps prevent freezing pipe, recovers better cores and faster reaming.

▪ ***OCS Double-Reduction Pumping Units***

These complete pumping units are enclosed, sturdy, compact and efficient machines for pumping oil wells where portable service equipment is desirable. These pumpers incorporate the high efficiency of roller chain and roller bearings in totally enclosed self oiling units. They can be equipped with either electric motors or multi-cylinder engines. With a V-belt drive from the prime mover to the unit primary shaft and a double-reduction of multiple roller chains in the unit, a triple reduction is obtained between the motor and the polish rod. An electrically welded steel case supports adjustable and self-aligning Timken Tapered Roller bearings which run in an oil bath for lubrication. The wrist pin bearings are Timken self-aligning while the beam bearings are weather proof self - oiling bearings. Proper balancing with the means provided with twin cranks gives a maximum capacity for units of this type.

Templeton, Kenly & Company

▪ ***Jacks***

Templeton, Kenly & Company, 1020 South Central Avenue, Chicago, Illinois, has on exhibit at Booths 439-441 its various types of Simplex jacks, among which the following are briefly described:

The No. 436 double chain pull rod jack, which was introduced to the market about a year ago, has a powerful 7-ton geared mechanism which makes it possible to pick up the deepest wells easily. This jack is used in conjunction with central powers or back crank units, eliminating kinked rods. It is easily carried and can be operated by one man. The equalized pull on the two chains brings the rods together in a straight line. The slack can be held while the jack "rack bar" is extended for additional travel. The positive friction holding slip and chain wedges eliminate such hazards as kick backs, causing severe injuries to the operator.

The display includes also a small pull rod jack of three tons capacity for shallower wells. This jack has the same features as the No. 436 jack, with the exception that the mechanism is not geared and that it is considerably lighter in weight.

Other jacks on exhibit are the No. 310 Simplex emergency, which pivots on its base; the Simplex riggers' jack, which is built in 5, 7½, 10, 15 and 20-ton capacities; the Simplex geared jack, built with right and left hand toe lifts; Simplex Journal, cable reel, pole and ball bearing screw jacks, as well as push and pull jacks that spread, clamp, lift and pull wheels and gears.

No. 310 Simplex Jack

National Lead Company, Baroid Sales Department

▪ ***Mud Materials***

Baroid Sales Department of National Pigments & Chemical Division of National Lead Company, Los Angeles, California, has on exhibit its various products, and also is displaying a model of laboratory equipment used to evaluate drilling muds. Included in the products shown at the exposition are:

Baroid, which is specially processed, pulverized barytes used as a weighting material in drilling fluid to control gas, oil, or water pressures and to assist in holding caving formations in place.

Aquagel—concentrated, gel-forming colloidal drilling clay. It can be mixed alone with water to form a light drilling mud, or added to native clay in small percentages. It builds a thin, impermeable cake on the walls of the hole and minimizes the amount of water which passes into the formation, which reduces the tendency of a formation to cave. It is of great assistance in preventing loss of circulation; in suspending cuttings during suspension of circulation; and in reducing abrasion and wear on pumps. It is of great benefit when added to cement to make what is frequently termed "Gel-cement."

Baroco—An economical salt-water-resisting drilling clay. This product was developed to resist the flocculation action of electrolytes encountered in drilling salt domes and in anhydrite and gypsum formations.

Stabilite—An improved chemical mud thinner furnished in liquid or powder form. It is used to reduce viscosity, free gas and improve wall-building qualities of drilling muds.

Fibrotex—A fibrous material, furnished in two lengths of fiber, specially compounded for the treatment of walls in which loss of circulation occurs.

Mud Testing Equipment—A complete line of apparatus used in evaluating drilling mud, such as Stormer and funnel viscosimeters, hydrometers, pH testers, elutriation apparatus, screens, stop watches. Also mud performance testers for determining cake thickness and water losses of muds.

E. I. Du Pont De Nemours & Company

▪ ***Neoprene Material***

E. I. Du Pont De Nemours & Company, Incorporated, Rubber Chemicals Division, Wilmington, Delaware, is displaying at Booths 1108-1110, its Neoprene products.

Neoprene is a material which resembles rubber in strength, resilience, elasticity and abrasion resistance, but which is superior to rubber for severe service as it resists the deteriorating effects of oils, gasoline, heat, ozone, oxygen, chemicals and aging.

The display includes the following products made of Neoprene, or which include Neoprene: oil suction and discharge hose, submarine hose, curb service hose, tank truck hose, fuel oil hose, rotary drilling hose, gaskets, molded articles, tubing, oil-proof sunlight resisting clothing, gloves, packers, valves, pistons, couplers, saddles, oil-resisting shoes, bearings and electrical cable.

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General Offices Mid-Continent Bldg.. Fort Worth, Texas

Wickwire Spencer Steel Company

▪ ***Wire Rope***

Wickwire Spencer Steel Company, 41 East 42nd Street, New York, has an exhibit that pictorially presents certain of the company's facilities to completely control the production of wire rope from the ore to the final laying operation. The display also features a presentation of the company's wire rope manual, "Know Your Ropes," and includes several reels of the rope itself.

Reel of Wickwire Spencer Rope

The Edward Valve & Manufacturing Company, Inc.

▪ ***Valves***

The Edward Valve & Manufacturing Company, Inc., of East Chicago, Ind., is exhibiting cast and forged steel valves for refinery, pipe line, and producing divisions of the petroleum industry. The following types of valves are exhibited in booths 708, 710 and 712:

▪ ***Forged Steel Stop Valves***

A complete line of screwed end, flanged end, and welding end globe and angle stop valves of forged carbon and alloy steels. Included are many types, from tiny gauge valves for instrument lines to large screwed end forged steel hydraulic valves for 6000 pounds working pressure. Flanged end valves include equipment suitable for the highest operating pressures and temperatures.

Edward Forged Steel Stop Valve

▪ ***Check Valves***

Forged and cast steel non-shock piston type and ball type check valves for pressures up to 6000 pounds.

▪ ***Boiler Stop Valves***

Edward 3- and 4-inch globe and angle stop valves for use on oil field boilers. They have full area, are remarkably compact, use EValloy trim.

▪ ***Hydraulic Valves***

Of special interest to production men is the Edward line of forged steel hydraulic valves suitable for pressures up to 6000 pounds.

▪ ***Boiler Valves***

Edward non-return, feedline stop-check, and blow-off valves for all boiler operating pressures.

▪ ***Relief Valves***

All-steel relief valves with ball type disks and totally enclosed bonnets will be of interest to users of heat exchangers, pumps, and many types of unfired pressure vessels.

▪ ***Strainers***

Users of traps, pressure regulators, pumps, etc., will find the Edward exhibit of forged steel strainers of value.

▪ ***Straight-through Valves***

Edward forged carbon and alloy steel straight-through valves with swivel plug disks are exhibited. These valves are for use on instrument and sampling lines under conditions where free open flow is imperative.

Regan Forge & Engineering Company

Regan Forge & Engineering Company, Los Angeles, California, has on display several types of crown blocks, a 76-inch traveling block, blowout preventers, and cast alloy steel hooks.

▪ ***Crown Blocks***

The type EB crown block is similar in design to Regan type B, except that it is of much heavier construction. All castings, with the exception of the sheaves in some minor parts, have been eliminated. The Regan staggered bearing principle has been embodied in massive proportions in keeping with the loads to be carried.

The type E crown block is constructed to meet the need for a simple continuous over and over reeving, using large diameter sheaves. Six sheave capacity is 360 tons, 7 sheave capacity 600 tons, with grooves for 1-inch, 1⅛-inch, or 1¼-inch diameter wire lines as desired.

Another type of crown block on display is the type F straight line single pin, built to sustain a safe load of 360 tons. It is a companion block to the Regan narrow traveling block, being only 24 inches wide from center to center of the outer sheaves on a 7 sheave block.

▪ ***Traveling Block***

The Regan 76-inch traveling block is designed to handle heavy loads at high speed. It is equipped with dual bearings and staggered sheaves. These blocks give long-life performance, and the few wearing parts can easily be replaced after years of service.

▪ ***Blowout Preventer***

Included in the display of Regan Forge & Engineering Company, is the type K blowout preventer. It can be instantly closed by remote control to pack off the opening around any size or shape of pipe, kelly or tool.

▪ ***Cast Alloy Steel Hooks***

A further item on display is the cast alloy steel casing hook, which is cast from SAE 4140 steel and heat treated. These hooks are tested in excess of the rated safe load capacity for which they are recommended. They can be furnished with single piece forge bail or open type cast bail as desired.

Schlumberger Well Surveying Corporation

▪ ***Electrical Well Logging***

Schlumberger Well Surveying Corporation, Houston, Texas, is displaying at Booths 1329-1331 various charts and instruments used in connection with its different types of well surveys.

The exhibit includes the following charts and instruments: a chart illustrating the main uses of electrical logs, such as correlations and determination of fluid content of formations; charts illustrating the main application of temperature measurements in wells, as for instance, location of gas sands, correlation between cased or uncased wells, location of cemented zones, etc.; as well as a demonstration set which illustrates the working of the Schlumberger thermometer.

▪ ***Dale Photo-Electric Device***

A further feature of the display is the Dale photo-electric instrument which is used to solve water-flow problems. A wall sampler and cores taken therewith is also shown.

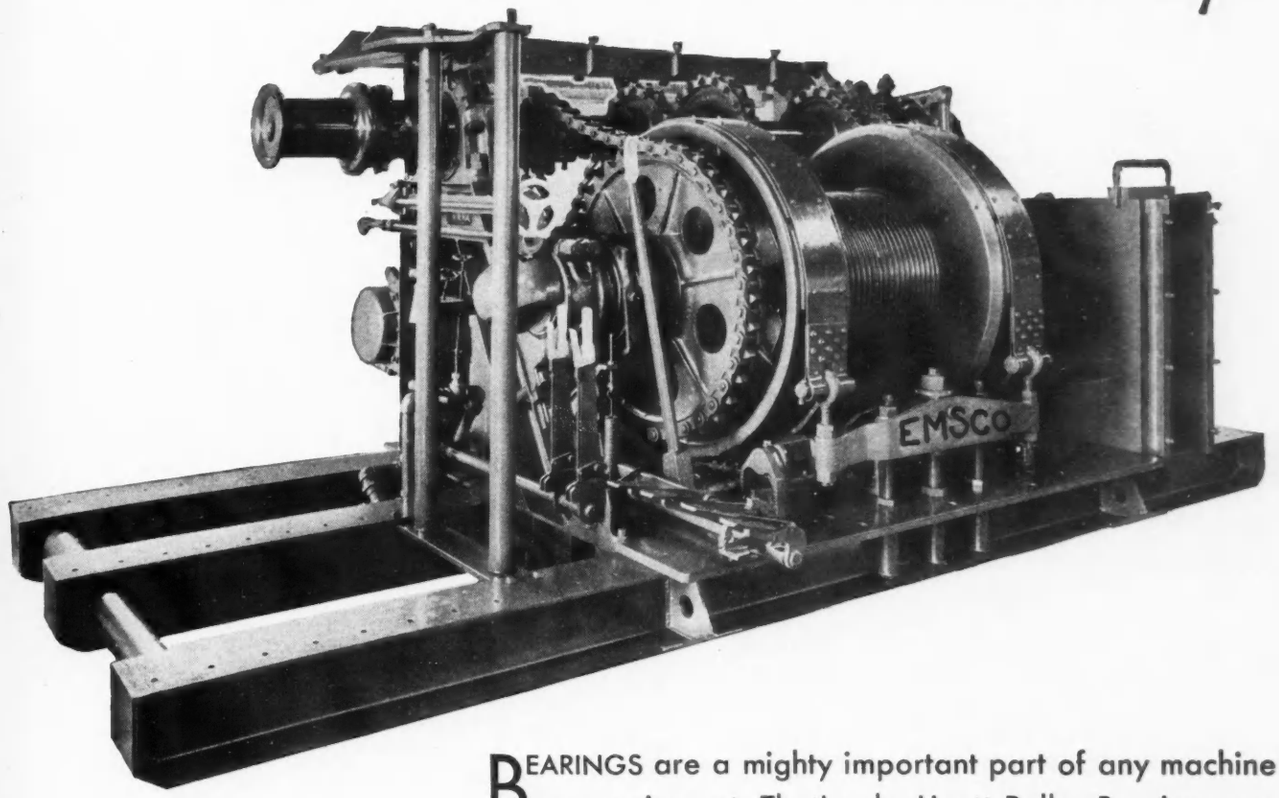
The Dayton Rubber Manufacturing Company

▪ ***Cog Belts***

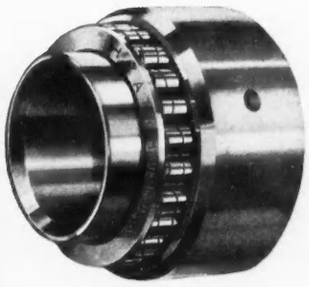
The following features of the Dayton Cog-Belt drives are being explained at Booths 256 and 258, which house The Dayton Rubber Manufacturing Company, Dayton, Ohio.

Minimum space is required by these drives because of smaller pulleys and extremely short center to center distances possible without use of idlers. Positive speed due to exact speed ratio being maintained through greater gripping power. Rugged, inasmuch as dust or moisture-laden atmospheres have no effect on Dayton Cog-Belts. Smooth starting and running because they absorb the shocks of power suddenly applied through "seating" action of belts in grooves. Eliminates vibration. Due to smooth running belts, the replacement extremely infrequent, no lubrication necessary, no dressing, exceptional long life. Correct mechanical design eliminates necessity of frequent "take-ups." Permits less tension, therefore, easy on bearings, machinery, etc.

RELIABILITY! with HYATT *Roller Bearings*



• Type "UBLS-54" Unitary Drawworks, a product of **EMSCO DERRICK & EQUIPMENT COMPANY**, designed for digging deepest wells, employs Hyatt Roller Bearings in self-aligning housings on all shafts.



BEARINGS are a mighty important part of any machine or equipment. That's why Hyatt Roller Bearings are so generously used, with complete assurance that they will give longer life under heavy loads, keep related parts in alignment, resist wear, minimize maintenance, and transmit the full measure of power. Not because of any secret formulae, but because of the advanced design by Hyatt engineers and precision manufacture of Hyatt craftsmen.

Evidence of Hyatt reliability is found everywhere . . . in mill and factory, on the farm, on railways and highways, as well as in the oil field. Certainly these bearings have a tough life, but Hyatts have definitely proved they can take it. Hyatt Bearings Division, General Motors Corporation, P. O. Box 476, Newark, New Jersey.

At the OIL WORLD EXPOSITION in Houston...Visit the Hyatt Exhibit...Spaces 704 and 706

American Sand-Banum Company, Inc.

▪ *Scale and Corrosion Chemicals*

American Sand-Banum Company, Incorporated, 9 Rockefeller Plaza, New York City, has on exhibition at booth 232, chemicals for the prevention of scale and corrosion, and the following items are briefly described:

S-B Standard is a pure colloidal concentrate that eliminates all formations of scale and corrosion in boilers. It does not contain any acid or caustic material, and is absolutely harmless to all equipment and persons applying it. S-B Standard's action is mechanical rather than chemical and holds all water impurities in suspension, thus preventing their crystallization into scale. Its simplicity, safety and certainty will render consistent service regardless of the operating conditions or the nature of the water used.

The display includes furthermore S-B Blue Seal Emulsion, which has the same characteristics as the Standard, but is only used for the cooling systems of internal combustion engines. This product not only eliminates and prevents scale, corrosion and rust, but it effectively prevents cracking of cylinder heads, leaks and overheating. It assures proper circulation of water, efficient heat transfer and increased lubrication.

Mine Safety Appliances Company

A full line of safety equipment for the oil and gas industry is displayed in the M.S.A. exhibit at the Oil-World Exposition. Many new developments since last year's show are presented, in addition to a number of well-known standard products of this company. Among the latter are the items below, of particular interest to oil and gas producers, refiners and pipe line operators.

▪ *Tank Gaugers' Mask*

Bureau of Mines-approved. Gives complete protection against hydrogen sulphide gas and other fumes from sour crudes and distillates, wherever there is sufficient oxygen present to support life. Type D mask consists of Kops-type facepiece with front Y-connection to two flexible rubber inhalation tubes, which pass over the shoulders to extra-sized canister carried on the back. Air flow is uninterrupted even when working on stomach, and wearer is assured of air supply even with one tube temporarily closed. Entire unit is light and comfortable to wear. Also available in Type C, with single inhalation type to canister carried in front.

▪ *Combination Hose Mask*

Furnishes ample supply of fresh air to workmen in any highly-concentrated gaseous or oxygen-deficient atmosphere. U. S. Bureau of Mines-approved for use by one or two men working with as much as 150 feet of 1-inch oil-proof hose to each mask. Kops-type facepiece has twin inhalation tubes carried over shoulders to hose connection at back. Strong safety-belt harness—linen web or leather optional. Double-outlet, slow speed high efficiency blower is full ball-bearing involute type, and crank may be turned in either direction.

▪ *Hydrogen Sulphide Detector*

Hand-operated, light, compact and easy to use. Quickly and accurately detects and measures low but dangerous concentrations of hydrogen sulphide in air—gives direct readings as low as .0025 percent by volume. Manufactured exclusively by Mine Safety Appliances Company, the detector is widely used in connection with production and refining of high-sulphur crudes.

▪ *M.S.A. Explosimeter*

A pocket size combustible gas indicator used for quickly testing flammable gas or vapor in air mixtures for explosibility. Gives accurate readings in a few seconds; reveals whether an atmosphere is below, within, or above the explosive range, and to what extent. One adjustment is all that is required to prepare the Explosimeter for use. It is the most easily operated instrument of its kind ever produced. Due to the use of a new type measuring circuit the life of the small batteries in this new instrument is unusually long.

▪ *M.S.A. Combustible Gas Alarm*

A constant guardian against the dangers of explosion. Designed to operate continuously on current taken from a regular lighting socket. Can be set to sound a danger signal in the event the concentration of combustible gas in the atmosphere under test exceeds any predetermined amount below the lower explosive limit. In addition, it can be used to control electrical equipment whose operation in an explosive atmosphere might be dangerous. Contained in a heavy cast aluminum case suitable for either wall or flush panel mounting.

▪ *H-H Inhalator*

This compact, portable, easily-operated instrument, used in conjunction with artificial respiration, supplies victims of respiratory failure with the correct mixture of oxygen and carbon dioxide for most effective treatment. The inhalator is universally used in the successful resuscitation of victims of gas asphyxia, carbon monoxide poisoning, electric shock, drowning, etc., and is officially accepted by Council of Physical Therapy of the American Medical Association, and approved by the American Gas Association and the Association of Police and Fire Surgeons.

▪ *M.S.A. Skullgards*

Made of hard, smooth bakelite of special composition, M.S.A. skullgards provide comfortable, durable and light-weight head-protection for the oil field worker. Skullgards are highly fracture-resistant, will not soften or deteriorate from the effects of oil, water or perspiration and are non-conductive to electricity. Available in eight hat or cap styles in sizes from 6 to 8 inclusive. The model K hat finds most favor with oil men.

▪ *First Aid Materials*

First aid materials of every type for inside and outside use on oil field service are manufactured by M.S.A. Dust-proof and water-proof first aid kits, first aid cabinets, stretcher outfits, bulk hospital supplies, pocket first aid packets, weather-proof salt tablet dispensers, portable drinking fountains, and a complete list of miscellaneous items are available. The most interesting of these articles are exhibited.

The Pressure Drilling Company

The Pressure Drilling Company, Houston, Texas, is exhibiting some of the smaller pieces of its complete line of pressure drilling equipment.

▪ *Grief Stems*

A round sectional flush joint grief stem, which is sealed by the same stripper heads or blowout preventer equipment that handles the rest of the drill pipe; being sectional, it may be transported in short lengths that are easy to move and hard to bend. The sections are joined by a special high pressure thread which can only be broken by a higher torque than is developed by friction in the swivel. The grief stem being round, it has greater fluid capacity and greater wall thickness than a square kelly of the same dimensions across diagonal; being sectional, the round grief stem may be made up to a length that will permit drilling hole for a double as well as a single.

▪ *Drive Bushings*

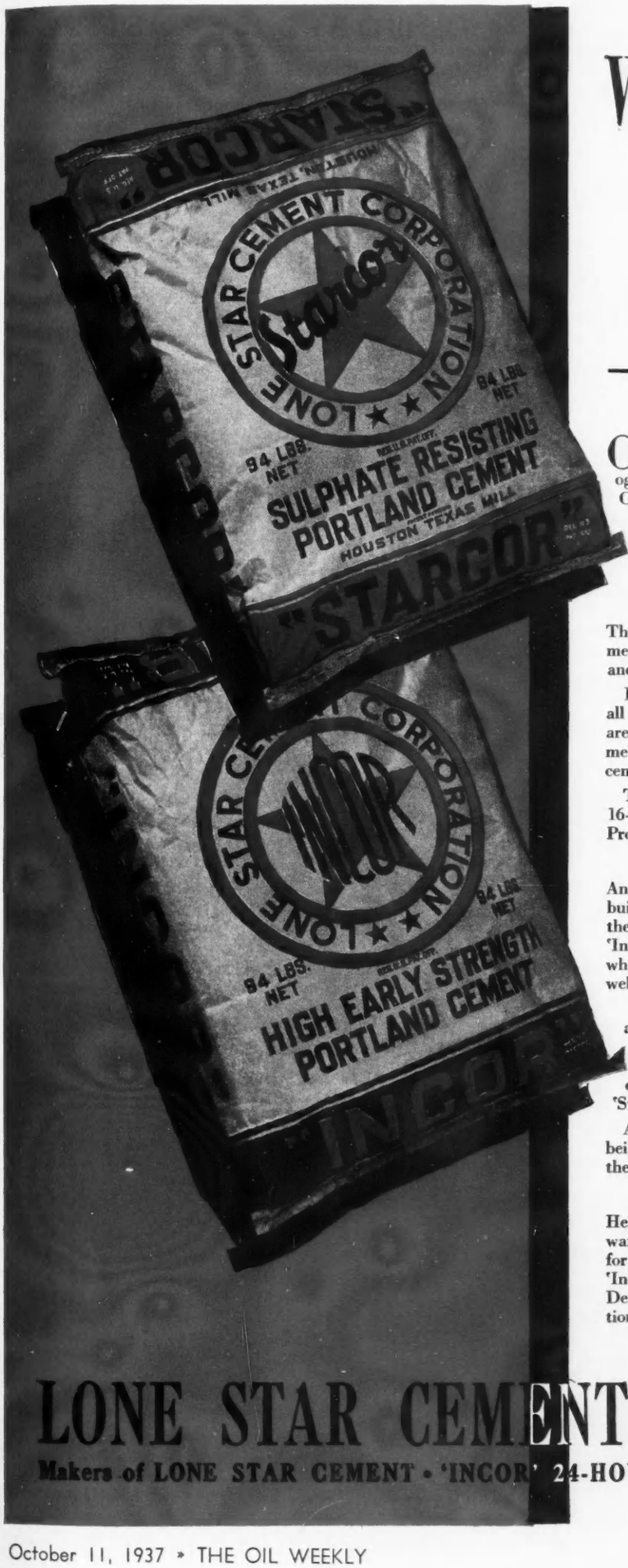
The round grief stem drive bushing operates on a "free wheeling" or over-riding clutch principle. There are over 100 square inches of serrated cam segments in driving contact, the torque being distributed over this wide area turns the grief stem without marking it sufficiently to, in any way, interfere with the stuffing box seal. No weight that can be read on the vernier hand of a weight indicator is held up by the drive bushing. The drive bushing fits the regular A.P.I. square in the rotary table and comes out on the flush joint grief stem in the same manner that an ordinary drive bushing comes out on a square kelly.

▪ *Back Pressure Valves*

The full-hole back-pressure valve consists of but two pieces—a pin-box sub that may be placed between any tool joint in the drilling string and a one piece dart that seals in any tool joint pin screwed into the back pressure valve sub. The construction permits more than a full-hole fluid passage through the valve in any type of tool joint from external flush to an A.P.I. full hole, consequently, there is no increase in velocity or back pressure exerted by any number of these valves in a drilling string.

▪ *Flow Beans*

An adjustable rotary flow bean made for the particular purpose of taking sand, cuttings or cavings carried in the circulating fluid from a well under pressure to the atmospheric pressure of the slush pit. The bean may be closed to a tight seal although partly cut out or may be opened sufficiently to permit the passage of any cuttings or cavings that will pass through the pipe on which it is screwed.



WHAT OIL MEN ASKED FOR

TWO PORTLAND CEMENTS —BOTH MADE FOR OIL WELLS

OIL-WELL work presents special problems which all-purpose cements were not designed to meet. Recognizing this fact, more than a decade ago Lone Star Cement Research Laboratories perfected 'Incor' 24-Hour Cement, which sets normally but hardens in one-fifth the usual time—the high early strength cement with an outstanding record of successful results in oil-well work.

Meeting Oil-Well Needs

Then, closely following oil-field developments, Lone Star met the newer problems presented as wells became deeper and hotter. And 'Starcor' Cement was perfected.

Both 'Starcor' and 'Incor' are true Portland cements, in all that the term implies. No admixtures or adulterants are used or needed. By carefully perfected processing methods, the needed special properties are built into the cement itself.

Thus, both 'Starcor' and 'Incor' pump easily in 15- or 16-lb. slurries. Stay gel-like to resist mud contamination. Provide a stronger, denser shut off.

Controlled Setting Time

And both cements have controlled setting time—an in-built safety factor to allow the slurry to get to the bottom of the well, with ample leeway for unforeseen contingencies. 'Incor' is "timed" for cementing wells of medium depth, while 'Starcor' is timed to set slowly in even the deepest wells, in the presence of high temperatures.

Then, while timed to set normally, both 'Starcor' and 'Incor' harden rapidly and thoroughly, once they are in place, and provide quick protection against gas agitation and ground-water seepage. You can drill out in 1 to 2 days with 'Incor'—2 to 3 days with 'Starcor'.

And both cements resist sulphate-water action, 'Starcor' being specially designed to provide extra protection where these conditions are serious.

Record of Dependability

Here, then, are two oil-well cements, made just as oil men wanted them made. Backed by Lone Star's 37-year record for unvarying quality and uniformity. Use 'Starcor'* or 'Incor'* on your next job. Both are stocked by Lone Star Dealers, for immediate service. Lone Star Cement Corporation, Dallas—Houston. Cable address: Cementus, Dallas.

*Reg. U. S. Pat. Off.

LONE STAR CEMENT CORPORATION

Makers of LONE STAR CEMENT • 'INCOR' 24-HOUR CEMENT • 'STARCOR' CEMENT

Lebanon Steel Foundry

▪ ***Castings***

Lebanon Steel Foundry, Lebanon, Pennsylvania, has on display in booths 1405 and 1407 various castings which are used in producing pipe line equipment. The castings shown, include the following: regulating valve parts, gas meter parts, gate and globe valve bodies of various description, pump casings, as well as other pump parts, flow line headers and return bends for stills, pipe line couplings, drill bits, casing slips, etc. These castings are made from either carbon steel, chromium steel or chromium nickel steel.

Leeds & Northrup Company

▪ ***Electric Control***

Leeds & Northrup Company, Philadelphia, Pennsylvania, exhibits at booth 426 various instruments, among which the Micromax electric control is the outstanding feature. This instrument has been completely engineered and manufactured by Leeds and Northrup, and is in operation at the show to demonstrate a new method of temperature control for multiple-hearth clay-burning furnaces. By using a Rayotube sighted on the material in the furnace, control is obtained directly from the temperature of the clay.

▪ ***Other Products***

Other equipment displayed by Leeds & Northrup Company, includes a cabinet - mounted temperature indicator with switches, a multiple-point, multicolor Micromax temperature recorder and several portable measuring instruments.

Reilly Tar & Chemical Corporation

▪ ***Coating Materials***

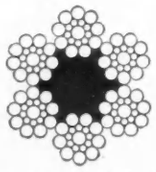
Reilly Tar & Chemical Corporation, Indianapolis, Indiana, has on exhibit at the Houston Show its complete line of Reilly Protective Coating Materials. Included in these are Reilly Pipe Enamels and Primer for the protection of oil and gas transportation lines, water lines and tanks, against corrosion and electrolysis; cold Application Coating No. 5, similar to the enamels but is applied cold; and Reilly Cold Application Coating No. 40, a metal paint for pipe, structural steel and any metal surfaces exposed to corrosive actions.

The enamels and C. A. No. 5 Coating materials are able to withstand extreme temperatures. They will withstand temperatures as low as minus 30° F. without cracking or checking and temperatures approaching 200° F. without sagging. The bond provided by Reilly Primer is said to be excellent and the enamel cannot be stripped from this pipe at 160° F. These materials are claimed to give permanent protection, are not affected by soil stress, and prevent corrosive action of acids, alkalies and electrolysis.

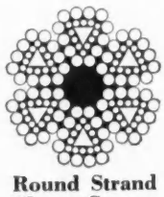
A. Leschen & Sons Rope Company

▪ ***Wire Rope***

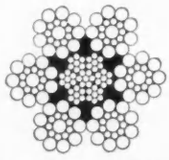
A Leschen & Sons Rope Company, St. Louis, Missouri, is displaying a complete line of specially designed lines for use in the oil fields at booth 217.



Flattened Strand Hemp Center



Round Strand Hemp Center



Round Strand Wire Rope Center

The company's display includes samples of various lines, among which are shown the three constructions of its "Hercules Red-Strand" rotary lines. The latter can be supplied in either standard or preformed types in either flattened strand hemp center, round strand hemp center, or round strand wire rope center.

Landis Machine Company

▪ ***Threading Machines***

Landis Machine Company is exhibiting its 13⅜-inch Receding Chaser Pipe Machine and the Landmaco Threading Machine.

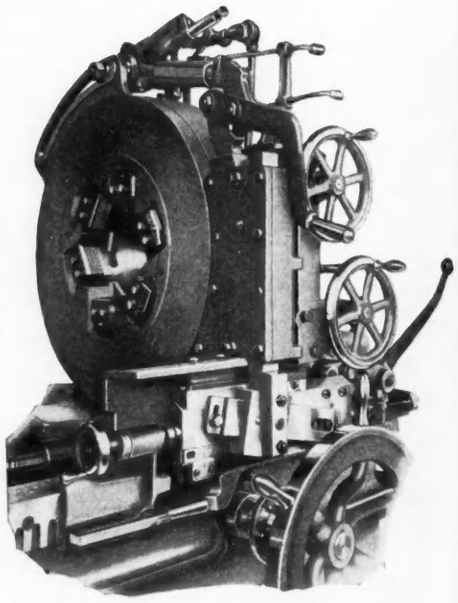
The Landis Receding Chaser Pipe Machine has many features to insure extreme accuracy for threads cut on casing, tubing and drill pipe. These machines will thread all diameters from 4½- to 13⅜-inch inclusive and require only one die head to cover this complete range.

The Receding Chaser Machine shown is similar in design to the Landis Machines which are used in pipe mills for the production threading of casing, tubing and drill pipe. The machine is readily adaptable to "job threading" and by its use the same accuracy for threads as produced in the mills, may be easily reproduced in the field.

Landmaco Threading Machine

The gear box of the Landis Receding Chaser Pipe Machine provides nine cutting speeds. The gears are all cut from steel and operate in a continuous oil bath. A continuous flow of oil is also provided to all bearings through the means of a gravity oil feed. Oil is pumped into a filter, located within the gear box where it is distributed by gravity to all bearings.

A rotary gear pump draws cutting coolant from a large reservoir located in the bed of the machine and supplies an ample flow of coolant to the chasers, at all times.



Landis Receding Chaser Pipe Machine

The Landmaco Threading Machine is a strictly modernized machine tool designed for threading rods, bolts, etc. The machine is sturdy in construction and is especially designed for accuracy under most severe operating conditions.

The Landmaco Threading Machine is built in both single and double spindle and is available in several different sizes ranging from ¼- to 1-inch on the one inch machine to ½- to 2½-inch on the 2½-inch machine.

The gear box is of the selective type. All gears are cut from chrome nickel steel, are hardened and burnished, and operate in a continuous bath of oil. Anti-friction bearings are employed throughout to increase wearing qualities.

Cutting coolant is supplied to the chasers from a large reservoir in the bed of the machine.

▪ ***Collapsible Taps and Die Heads***

A complete display of Landis Collapsible Taps and Landis Die Heads for the internal and external threading of tool joints, float collars, etc., are shown also.

Frictionless Strength

Proved

High Fatigue Value . . .
top grade alloy steel

▼

Greater Capacity . . . . .
solid rolls of greater length

▼

Permanent Alignment . .
riveted, rigid cage

▼

Available in a large variety of sizes and in pillow blocks designed to meet specific conditions of mounting. Write for literature.

IN TEN YEARS' SERVICE ON AMERICA'S LEADING RAILROADS

If you insist on a *proved* heavy duty roller bearing, you will do well to choose Fafnir. Proved in ten years of railroad service, Fafnir Roller Bearings are built to render at least *one million miles* of satisfactory performance.

In the oil fields, life does not so often depend on perfect bearing performance as on the railway. *But time and dollars do . . .* avoid costly breakdowns; assure your equipment the same unbroken record the crack passenger trains maintain . . . with Fafnir Heavy Duty Roller Bearings. Fafnir Bearings, Inc., New Britain, Conn. Prompt deliveries to the oil fields from large warehouse stocks at Kansas City, Dallas, Denver and Los Angeles.

Heavy Duty FAFNIR ROLLER BEARINGS

Oil Well Supply Company

▪ ***Drilling & Pumping Machinery***

Oil Well Supply Company, Dallas, is occupying spaces 532, 534, 536, 538 and 540 in the main building. Its exhibit is featured by two major innovations in rotary drilling machinery, of which the Oil-World Exposition display is the initial showing.

Duff-Norton Manufacturing Company

▪ ***Lifting Jacks***

Duff-Norton Manufacturing Company, Pittsburgh, Pa., offers a complete line of lifting jacks.

The company's general purpose (Four-Way No. 1523) jack is a feature of the display. This general purpose jack is exceptionally useful and dependable, just the thing for rough and ready service. It is sturdily built, but extremely light in weight for capacity. It is conveniently handled and spotted, yet easily operated by one man. A pivotal base permits the jack to be operated at any angle for shoving, pushing, etc. All working parts are fully enclosed and protected from dirt. Built without screws, there is no danger of parts coming loose or getting out of adjustment. Spring mechanism is self-contained in removable housing, which may be taken bodily from the jack. It has no loose pieces, bolts or nuts to adjust. A steel chain fits into slots on top of jack and can be used as a sling to engage various objects. A double socket lever aids effective operation in close and cramped quarters.

Baldwin-Duckworth Chain Corporation

Baldwin-Duckworth Chain Corporation is exhibiting in spaces 314-16 in the main auditorium, and has a wide variety of chains and other products on display, as follows:

▪ ***Super Depth Rotary Chain***

This chain, being displayed for the first time, is a new development in chain design. It has been brought out particularly for extra heavy service and carries a high ultimate strength rating.

▪ ***Super Service Chain***

This chain is of standard straight side bar construction, but is equipped with the new patented solid cotter retaining pin. The manufacturers claim for this pin that it gives all the advantages of the riveted type chain with none of the disadvantages of the detachable type.

▪ ***Full Flex Chain***

This chain is of offset side bar construction, popular priced, and is designed to handle all rotary chain requirements for nominal depth wells.

▪ ***Roller Chain***

A full line of all types of roller chain is being displayed consisting of single, double, triple and quadruple widths both in standard and heavy duty series.

▪ ***Sprockets***

A full line of cut tooth sprockets in single, double, triple and quadruple widths are shown. Cut tooth sprockets are now made in all pitches and the use of such sprockets in the oil fields is constantly increasing.

▪ ***Flexible Couplings***

Baldwin patented full flexible chain coupling is on exhibit. The patented feature of this coupling covers the double chain, which is equipped with straight rollers in one strand and convex rollers in the other. The manufacturers claim that the above coupling differs from ordinary chain couplings in that they are designed without destructive back lash and yet flexible in every way. The couplings are capable of operating with as much as 3 degrees angular misalignment without harm to the coupling.

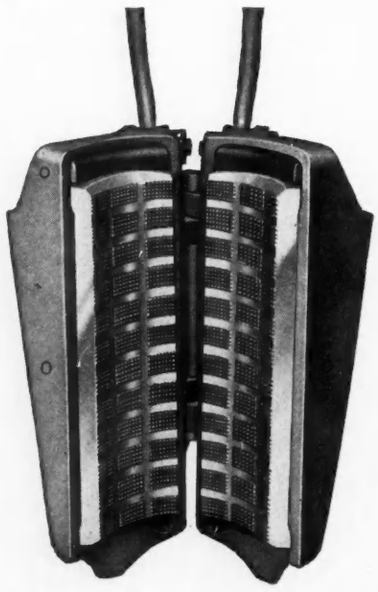
Also displayed is a full line of standard double chain flexible couplings.

Baash-Ross Tool Company

▪ ***Rotary Slips***

New self-aligning rotary slips are introduced formally to the industry at the Oil-World Exposition by Baash-Ross Tool Company. The new slips will be displayed in Booths 120 and 221 of the Norvell-Wilder Supply Company section. The other items in the extensive Baash-Ross line of drilling, fishing and production tools is scheduled for display in Booths 1037 and 1038.

The new self-aligning rotary slips embody an entirely new principle, it is said, which enables them to compensate for wear irregularities and distortion of the master bushing and to align with the pipe automatically in all positions. The liners of these slips are provided with a gripping surface of new design which maintains a positive grip on the pipe without cutting, swedging or otherwise injuring it.



Baash-Ross Self-Aligning Rotary Slip

▪ ***Other Products***

Included in the general display in Booths 1037 and 1038 will be many new and standard Baash-Ross tools. The automatic torque controlled rotary jar, releasing rotary spear and releasing rotary socket, casing cutter, drill pipe cutter, star wheel perforator and long knife perforator are shown. Among other production tools the display includes the Baash-Ross open end tubing spider and non-sparking oil saver.

Ridge Tool Company

Ridge Tool Company, Elyria, Ohio, is displaying its various types of pipe tools, among which are the following:

▪ ***Wrenches***

By means of a redesign in the Ridgid wrench, a 75 percent reduction in wrench repairs and replacements has been effected, it is claimed. These wrenches are all heavy-duty with guaranteed unbreakable housings of double-strength alloy metal. The jaws are of chrome molybdenum alloy, the heel jaw is replaceable and the full-floating hook jaw has a handy pipe scale. This wrench is made in an end pattern for pipes in tight places.

▪ ***Threaders***

The display includes also Ridgid threaders, which provide strength and precision, and protect against "cocking" or "wobbling." Threader No. 65R threads four sizes of pipe, 1 to 2 inches, with one set of dies. A simple move will change the plate to the size of the pipe and the threader is ready for work. No. 65 Ridgid No. 1 and 1R poster threaders have full-floating posts, enclosed die locks, and special tool steel dies are interchangeable with any make of poster threader.

▪ ***Pipe Cutters***

On exhibit are Ridgid pipe cutters, made with internal reinforcing of tempered steel which will not break or warp. The rollers are interchangeable to make a three-wheel cutter. The wheel blades are made of special alloy and are coined, hammered, heat-treated and assembled in a steel-bearing hub.

▪ ***Pipe Vises***

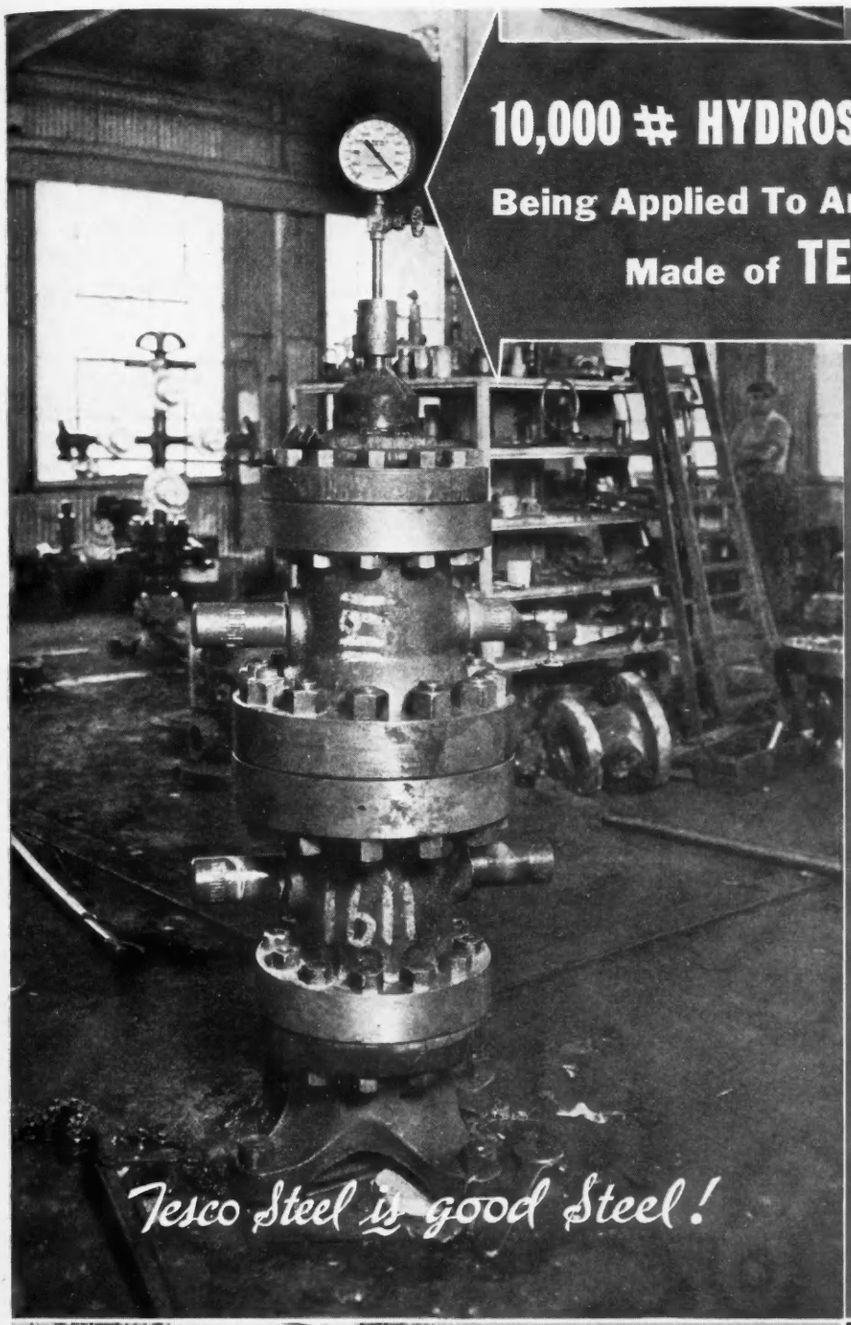
Ridgid pipe vises on display are conventional in design, with the exception of the new streamlined chain vise. All types have pipe rests and pipe benders and incorporate unusual features. No-mar jaws are available in yoke vises of 2 and 2¼-inch. Capacities and frames are of strong special malleable.

▪ ***Screw and Pipe Extractors***

A new method of taking out broken threaded ends of screws is made possible with the Ridgid "Long Grip" screw and pipe extractors. Extractors are made with straight flutes, the tool straight from end to end so it freely passes through holes to engage thin shells of drilled out broken ends at depths. These extractors are furnished in complete sets with Ridgid drill guides and special drills for taking out any diameter screw end.

10,000 # HYDROSTATIC PRESSURE

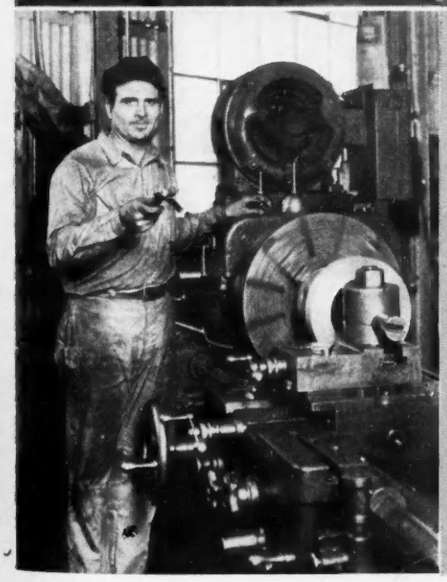
Being Applied To An O-C-T Casing Head Made of TESCO STEEL!



TODAY'S high pressure oil well equipment demands the best in alloy steels, and Tesco, operating *the only exclusive jobbing steel foundry in the South*, provides it. Tesco metallurgists understand the demands made on steel in the field, and, through scientific control of physical and chemical properties, and the use of modern foundry equipment, produce the best possible steel for a given requirement.

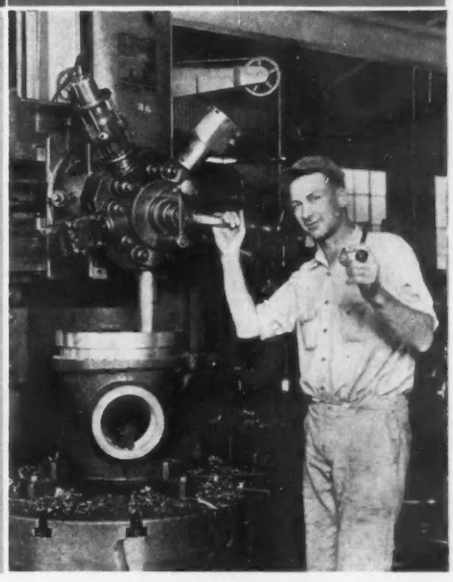
TEXAS ELECTRIC
TESCO
STEEL CASTING CO.

HOUSTON TEXAS



MASTER MACHINIST T. E. McCAIN, LEFT, SAYS: " . . . after working with steel for fifteen years I recognize a good casting when I machine it. In my opinion, Tesco steel is good steel."

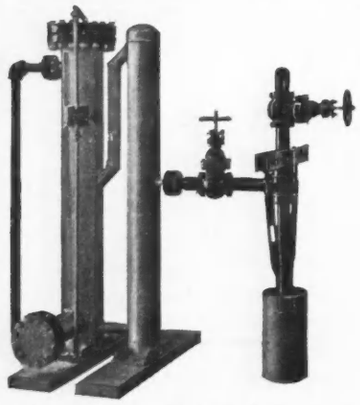
J. J. LOWRANCE, RIGHT, ADDS: " . . . I've been machining steel for a mighty long time, and I don't mind telling you that this Tesco steel is the finest I've ever put a cuttin' tool on."



Union Gas System, Inc.

▪ ***Automatic Gas Separator***

Union Gas System, Inc., of Independence, Kansas, has on exhibit a separator designed to separate water, gasoline, and oil from natural gas. It may also be used as a dump valve on main pipe lines to replace hand operated syphons.



Union Automatic Gas Separator

The Union automatic gas separator will operate with safety on high working pressures, and is built to maintain dependable operation under severe field conditions. All working parts are enclosed. The open float construction permits equalization of pressures inside and outside of float to prevent collapse. All valve parts are readily accessible for cleaning or repairs. The fluid may be piped a considerable distance into elevated tanks or carried against back pressure into vapor tight tanks where gasoline is extracted.

Five sizes of separators are available with capacities of cubic feet for 24 hours from 65,500 to 14,534,300.

Big Three Welding Equipment Company

▪ ***Lincoln Welding Equipment***

Big Three Welding Equipment Company, Houston, Texas, is displaying at Booths 735-737-739 the products of the Lincoln Electric Company, Cleveland, Ohio. Exhibiting with the Big Three Welding Equipment Company are: Osage Metal Company; The Smithweld Company; Corpus Christi Oxygen Company, Houston Oxygen Company and Victor Equipment Company. These concerns will also feature various items of welding equipment.

Three styles of electric welding machines will be displayed: A gas engine driven, 300-ampere electric arc welder, a 300-ampere electric driven Lincoln electric arc welder, and a 150-ampere electric driven Lincoln arc welder.

Actual electric welding on oil field drilling bits is being featured, with a protective booth to surround the welder. Colored glass has been inserted in this booth to permit visitors to see the actual welding as it progresses without injury to their eyes or from any flying sparks.

Another feature of the exhibit will be a free offer of a mild steel plate to visitors with their names welded on to the blank piece of steel, making an attractive name plate for their homes.

Further products on display include: 20 different varieties of electric welding electrodes, welding cable, protective leather clothing for operators, electrode holders, protective shields and glasses and various other small items used in connection with welding.

The exhibit includes furthermore actual samples from welds in all classes of metals, as well as sample welds of oil well casing, both butt welded type and bell and spigot welded type.

Portable Rig Company

▪ ***Drilling Machinery***

The exhibit of Portable Rig Company, Houston, Texas, at the Oil-World Exposition includes two portable rigs, Models R-876-8 and R-810-6, in operation on a derrick floor. The derrick is built on a low sub-structure.

Also included in the exhibit are two utility units composed of an electric generator, air compressor and water pump, as well as a representative showing of Waukesha engines using natural gas, gasoline and Diesel fuel.

Happy Belting Company

▪ ***Belting & Pumping Equipment***

Happy Belting Company, Tulsa, is exhibiting in outdoor space 1007. The products exhibited by this company consist of the following:

Happy flexible pumping unit run by a multiple-cylinder engine.

Durnell back-side crank unit, which will be run off the Happy flexible pumping unit.

A Happy countershaft which is equipped with Timken bearings, and a Medart ball bearing equipped clutch, outboard bearing and pulleys.

The following items are on exhibit in the Happy Belting Company booth also: Happy No. 7 belt tightener; Happy valve cups; Happy ball and seats; Happy belts; Dayton V-belts; and Happy demountable rim sheaves.

Bethlehem Steel Company

▪ ***Tubular Goods, Line Pipe, Sucker Rods and Other Products***

Bethlehem Steel Company, Bethlehem, Pa., is occupying Booths 548, 550, 552, 554, and 556. Exhibits include various sizes of line pipe and Bethlehem special high tensile lap-welded casing, with test specimens from crush tests and welds; sucker rods; a complete line of bolts, studs, and nuts, plain and alloyed; high pressure screws for return bends; stainless steel thermowells; derrick and tank bolts, plain and galvanized; tool joint forgings and pump liners, roller bit type, full hole; alloy steels in as: rolled, cold drawn, ground, polished, and planished form; Bethanized strand fence, nails and other wire products; galvanized sheets and roofing; tin plate and terne plate for oil cans and containers. Transparencies on forging and pipe manufacture and murals depicting operations in the production of alloy steel will be prominently displayed.

Larkin Packer Company, Inc.

Larkin Packer Company, St. Louis, Missouri, is exhibiting the following:

▪ ***Floating and Guiding Equipment***

Larkin concrete float shoes, float collars and guide shoes, with the following features: Forged and heat-treated steel, with 77,000 pounds tensile strength; hob cut threads; 7-inch square opening; by-passes in water channel to prevent plugging; mechanical, poppet-type valve, machined and lapped, positive acting and absolutely water-tight; 240,000 pounds valve back pressure strength; 8 inches of concrete reinforcing all valves; all concrete parts made of Red cement. Larkin Bakelite float shoes, float collars and guide shoes have these same features, except the Red cement. In addition, their valves and guides are made of tough, light, easy-to-pulverize fabric bakelite.

▪ ***Casing Shoes***

Larkin casing shoes feature: the use of the highest grade steel obtainable; careful forging to correct size, with no seams or welds; proper heat-treating and annealing; accurate machining; cutting of threads on a thread miller.

▪ ***Swage Nipples and Bull Plugs***

Seamless bull plugs are pressed from new flat strip steel, cupped and drawn into plugs which have neither seams nor welds at side or end. Swaged nipples are forged from new seamless full-weight pipe or casing. Uniform length, shape and outline, ends faced square, perfect threads, bevelled for easy starting, inside edges chamfered. In sizes one inch and smaller, Larkin nipples and bull plugs may be had in improved hexagon shape.

▪ ***Packers***

Quality of rubber and high grade workmanship are used in making Larkin packers.

▪ ***Lead Seal "J" Tools***

These tools are made entirely of seamless steel. Lead is virgin pig lead. All threads are milled.

▪ ***Spiders***

Larkin "Hevi-Duty" spiders are made in either solid or split type. Larkin "Standard" is made in solid type only. They are made of best grade of cast steel obtainable. Slips are made of high carbon forged steel.

▪ ***Casing Heads***

Larkin casing heads are made of highest grade cast steel obtainable. Equipped with four tie-down and two 3-inch outlets. Either rubber or special fire-proof packing is furnished. Tested 5000 pounds per square inch.

▪ ***Clamps***

Forged with accurately machined dies, and 80 percent of the circumference of pipe contacted by the clamp.

"SEE YOU AT THE OIL SHOW"

EVERYONE INTERESTED IN SCHLUMBERGER SERVICES IS CORDIALLY INVITED TO VISIT OUR EXHIBIT AT THE EXPOSITION.

SCHLUMBERGER

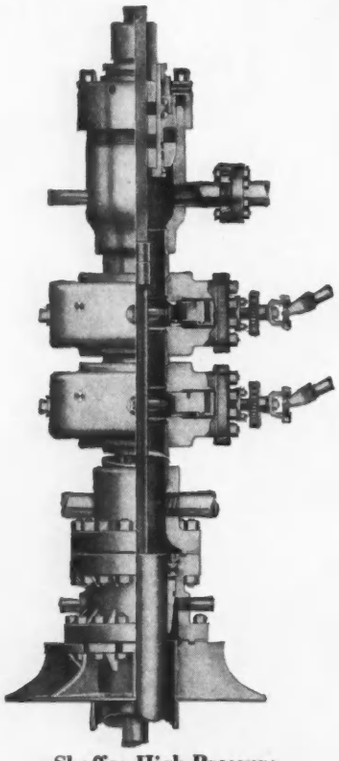
WELL SURVEYING CORP.

Shaffer Tool Works

In Booths 317, 319 and 321, the complete line of Shaffer Tool Works high-pressure drilling control equipment are on display, together with other products listed below.

▪ *High-Pressure Drilling Equipment*

A typical hook-up, as illustrated, is on exhibit, consisting of the following (please read from bottom to top)—A Shaffer landing base; a Shaffer spool type landing head; Shaffer high-pressure mud cross with outlets for mud line connections; two Shaffer cellar control gates, one a master gate for



Shaffer High-Pressure Drilling Hook-Up

protection when the pipe is out of the hole, and one for protection with pipe in the hole; and a Shaffer rotating blow-out preventer, equipped with the new stripper, not shown in this view.

A demonstration of Shaffer cellar control gates operating under pressure is an interesting feature of this exhibit.

▪ *Universal Tubing Control Heads*

This simple, compact unit serves as a blowout preventer while drilling in and tubing the well. Generally used with a Shaffer tubing flow control valve at the bottom of the tubing, to permit raising or lowering the tubing at any time without any necessity for killing the well.

▪ *Adjustable Flow Beans*

Effective means for controlling the flow of liquid through a line, and regulating the pressure and the rate of flow with extreme accuracy, are all possible with Shaffer adjustable flow beans. The new hard metal inserts, which add greatly to the efficiency and life of these flow beans are demonstrated at the show.

▪ *Rotary Releasing Sockets*

Made with either right-hand or left-hand tools, for recovering drill pipe, casing, liners, tubing, or any type of fish for which a socket may be used. Demonstrations show the positive action of Shaffer rotary releasing sockets, and the ease with which they can be released when desired.

▪ *Double Bowl Rotary Releasing Sockets*

This device has an upper set of slips to grip the drill pipe, and a lower set for gripping the tool joint. The packing element above the upper bowl packs off around the drill pipe. The tool joint is packed off by a packer element assembled in the guide shoe so that the packer fits close against the lower end of the tool joint slips. This tool is always ready to run (without changing the slips) and takes hold of and packs off the fish, regardless of whether the twist-off has occurred in the pipe or the tool joint.

▪ *Rotary Releasing Spears*

For removing casing or pipe, for setting liners, for holding or left-handing jobs, and used in conjunction with any type of rotary jar. The slips set positively, but are released readily when necessary. Made in different types for use with either right-hand or left-hand tools.

▪ *Expanding Pin Taps*

This device is designed for the purpose of left-handing or backing-off strings of drill pipe which have been "stuck" in the hole, with the tool joint box or the coupling up. When a string is stuck in a tight, or close hole, so that it is impossible to go over the box end, and the ordinary fishing tap is too light to take a strong hold, the Shaffer expanding pin tap may be used, as it makes a connection as strong as any other part of the fishing string. It may be released in the hole as many times as desired.

▪ *Shaffer Improved Packers*

This improved packer provides an efficient means for controlling the release of gas from the sand, and aids in the economical production of oil by this method. Shaffer improved packers' rubber packing element does not wedge tight at every attempt to pull the packer. The Shaffer packer design applies a pull upon the upper end of the rubber packing element, and by elongating the rubber reduces its diameter, thus making it an easy matter to release contact with the casing.

▪ *Water-Test Packers*

The design and construction of this type packer makes it ideal for long, hard service in testing for water. All parts are extra-heavy and extra-strong, and continued use does not affect its positive action. The Shaffer method of releasing the packing element by pulling on the upper end, results in elongation of the rubber packer, thus reducing its diameter and insuring easy release.

▪ *Shaffer Kelly Cocks*

This high-pressure, quick acting, shut-off valve is placed above the Kelly to protect the rotary hose and provide positive control in event the well blows in through the drill pipe. The plug is not tapered and does not fit closely in a seat, but acts as a guide to carry a valve just large enough to cover the hole. The friction surface is very small and a ball race carries the end thrust. Made in two types, one for normal drilling conditions, and the other with a heavier, heat treated body for the severest conditions.

▪ *Polished Rod Adjusters*

Also referred to as the Shaffer rod spacer, this device makes it possible for one man to re-space rods on troublesome pumping wells, without having to stop the pump. It also adds to the life of sucker rods by providing a means for turning the rod to any one of four positions, at regular intervals. It is ideally suited to deep wells with low fluid level, as the pumper can readily re-space after the rods have stretched.

Brown Instrument Company

▪ *Control Instruments*

Brown Instrument Company, of Philadelphia, Pa., a division of Minneapolis-Honeywell Regulator Company, is demonstrating control instruments in Booth 734. These instruments—indicating, recording, controlling—are in actual operation and consist of the following:

The Brown Pneumatic Control Transmission System, in which temperature, pressure, flow and liquid level measurements may be indicated, recorded and controlled remotely from the point of measurement. This is a new, pneumatic telemetering system, and is particularly applicable to hazardous locations where the use of electricity is to be avoided.

The Brown Pneumatic Interlock Control System, wherein one medium may be controlled in response to variations in another. The control index of flow controller, for example, may be positioned automatically from a liquid level recorder.

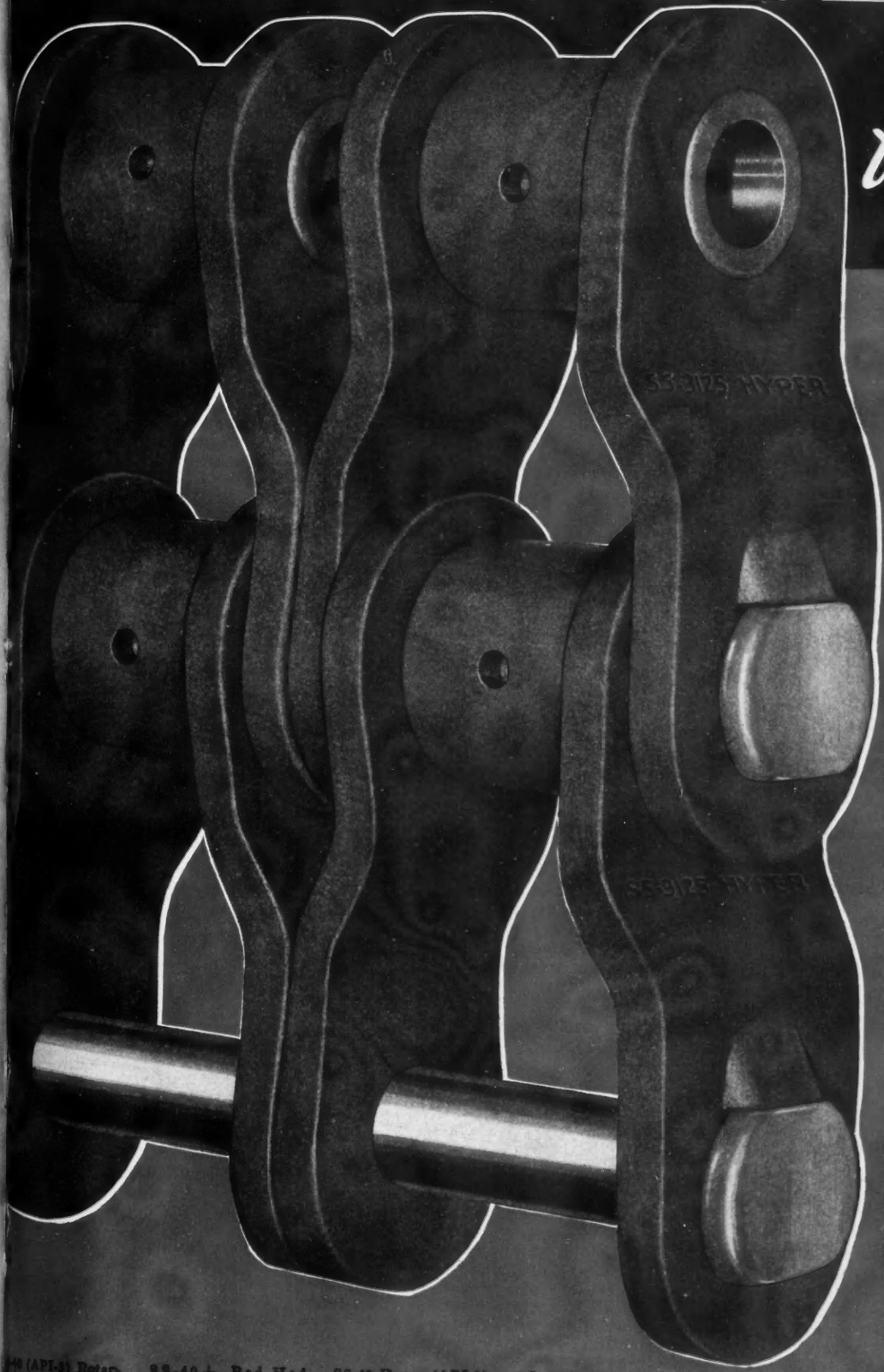
The Brown Air-Operated Controller with safety cut-off switch may be set to give a signal or alarm, or to stop and start motors, when a predetermined value on the chart is reached. The switch has a capacity of 10 amperes at 110 volts.

Where it is desirable to record several temperatures on one chart, the Brown Multiple Recording and Controlling Numeral Printing Potentiometer will not only record but also control from one to six temperatures

A New LINK-BELT HYPER CHAIN

SS-3125

for High Speed Drilling

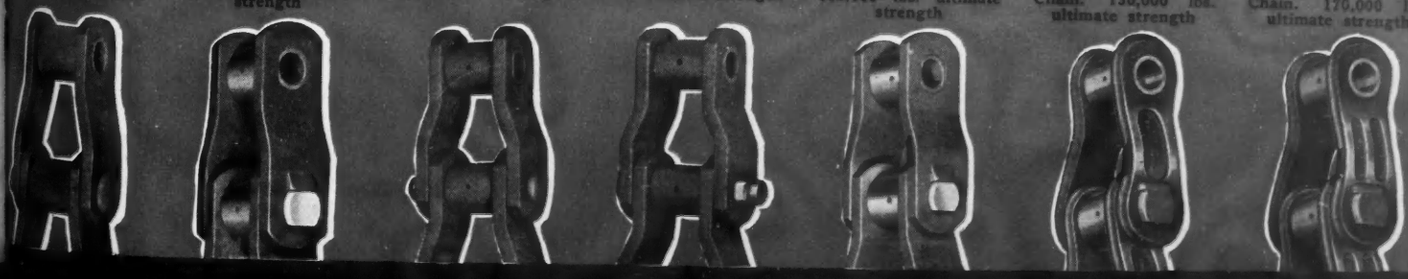


● This NEW Link-Belt High Speed Rotary Chain (230,000 lbs. ultimate strength double and 115,000 lbs. single width), recently introduced to the field in double and single widths, is on display, Booths 416-418-420, Oil-World Exposition, Houston, Oct. 11-16. It represents a part of the exhibit which is displaying a LINK-BELT Chain for every Oil Field Service, as well as Rotary Mud Vibrating Screens, Silent Chain Drives, Roller Chain Drives, Flexible Couplings, Speed Reducers, Pillow Blocks, Clutches, Take-ups, Collars, and other products.

LINK-BELT COMPANY

INDIANAPOLIS PHILADELPHIA
CHICAGO LOS ANGELES NEW YORK
HOUSTON TULSA DALLAS

7165



-40 (API-3) Rotary ... 28,000 lbs. ultimate strength

SS-40+ Red-Hed (API-3) Rotary Chain. 48,000 lbs. ultimate strength

SS-40 Hyper (API-3) Rotary Chain. 75,000 lbs. ultimate strength

SS-124 (API-4) Rotary Chain. 60,000 lbs. ultimate strength

SS-124+ Red-Hed (API-4) Rotary Chain. 112,000 lbs. ultimate strength

SS-124 Two-Bar Hyper (API-4) Rotary Chain. 130,000 lbs. ultimate strength

SS-124 Three-Bar Hyper (API-4) Rotary Chain. 170,000 lbs. ultimate strength

from as many different thermocouples. Three outstanding features are claimed for this system: 1. The chart drum is made of steel with a culvanized rubber cover, as used on typewriters; 2. It uses specially hardened steel print wheel with machine cut numerals to assure maximum legibility of records; and 3. The plus sign is used for recording temperatures.

The Brown Air-o-Line Control System for coordinating temperatures, pressures, flows and liquid levels.

Brown Flow Meters, made both in electrical and mechanical types.

Brown Resistance Thermometers for measuring, indicating, recording and controlling temperatures.

Brown Manually Balanced Potentiometer, which is an indicating manually balanced potentiometer in a large switch cabinet for supervisory temperature measurements.

Visco Products Company, Inc.

Visco oil treating chemicals, and Stabilite for the chemical treatment of rotary drilling fluids are featured in the exhibit of Visco Products, Inc., of Houston, Texas. A description of these products follows:

▪ *Visco Oil Treating Chemicals*

These products are for the breaking and resolution of oil field emulsions, commonly referred to as "B.S." Instead of being compounded by mixing various substances in an effort to produce effective reagents, the active principle in each Visco formula is a complex synthetic chemical especially made in a modern plant under a system of rigid chemical control.

▪ *Stabilite Chemical Mud Thinner*

Stabilite is sold in both liquid and dry forms.

The Baroid Sales Department of the National Pigments and Chemical Company, and its distributors have stocks of Stabilite convenient to all active fields, and field service is maintained by the Baroid organization in connection with their own products.

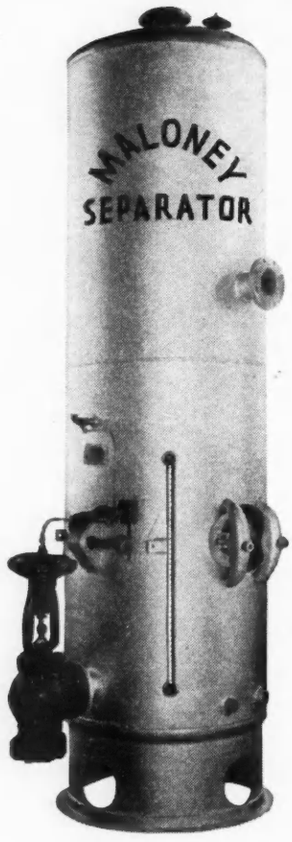
Maloney Tank Manufacturing Company

▪ *Separator*

Maloney Tank Manufacturing Company, of Tulsa, is exhibiting a newly improved oil and gas separator in Lot 1012-B.

This separator is said to offer a number of new features, the principal one of which is its mist traps. These separate all the oil from the gas vapors, and allow the dry gas only to escape through the vent in the top of the separator. Another feature is the increased capacity of the initial chamber where the oil and gas enters the unit. This chamber provides a higher vertical travel for vapors or gases as they enter the new knock-out element.

The Maloney separator is manufactured in standard sizes and working



pressures, and is constructed to comply with the API and ASME standards.

▪ *Maloney Tanks*

The company also is exhibiting a Maloney storage tank with standard coating consisting of an over-all priming coat of the company's special red chromated iron oxide primer and an outside finish coat of heavy aluminum paint. A complete Maloney hot-dip-galvanized bolted steel tank is being shown also.

▪ *Steel Stairways and Walkways*

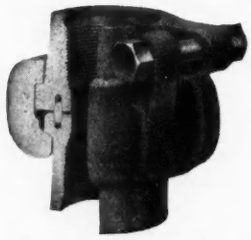
Maloney also is displaying its self-supporting, cantilever-type sectional steel stairway and walkway, designed in accordance with the new recommendations of the API.

Thornhill-Craver Company

▪ *Couplings*

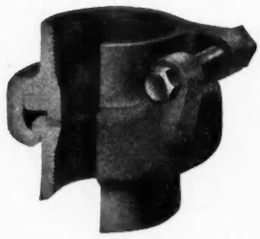
Thornhill-Craver Company exhibit is displaying Unibolt, a one-bolt coupling including the high-pressure steel Unibolt with replaceable seat ring for all pressures and all temperatures; the medium pressure Unibolt with replaceable gasket; and the "Big Inch" Unibolt, which is equipped with a blanking plug for use on pump suctions for compounding slush pumps and for dead ending lines.

The Unibolt employs the use of a single bolt, which functions only to draw together self-locking tapered shelves, thereby making a fast connection without having strain on the bolt during the period of service. The tapered shelves in the nut and on the hub of the coupling are spaced equi-distant around the circle of the seat so that an equal pressure at all points of the seat circle is exerted. One set of shelves is made integral with one hub



High Pressure Unibolt

of the couplings and the other set is made integral with the nut or outer member of the coupling. The single-bolt feature offers fast and easy assembling and dismantling, and permits application of the Unibolt in close, inaccessible places.



Medium Pressure Unibolt

The "big inch" coupling employs the use of two bolts so that the interchangeable blanking plug can, at any time desired, be interchanged with one hub, forming a dead end. The grooved shelf design on the hubs of the coupling is duplicated on the blanking plug so that it perfectly fits the shelves of the nut. The coupling, when employing use of the blanking plug on pump suction line, serves the job of a gate valve in compounding. It makes a dead end for pipe line work.

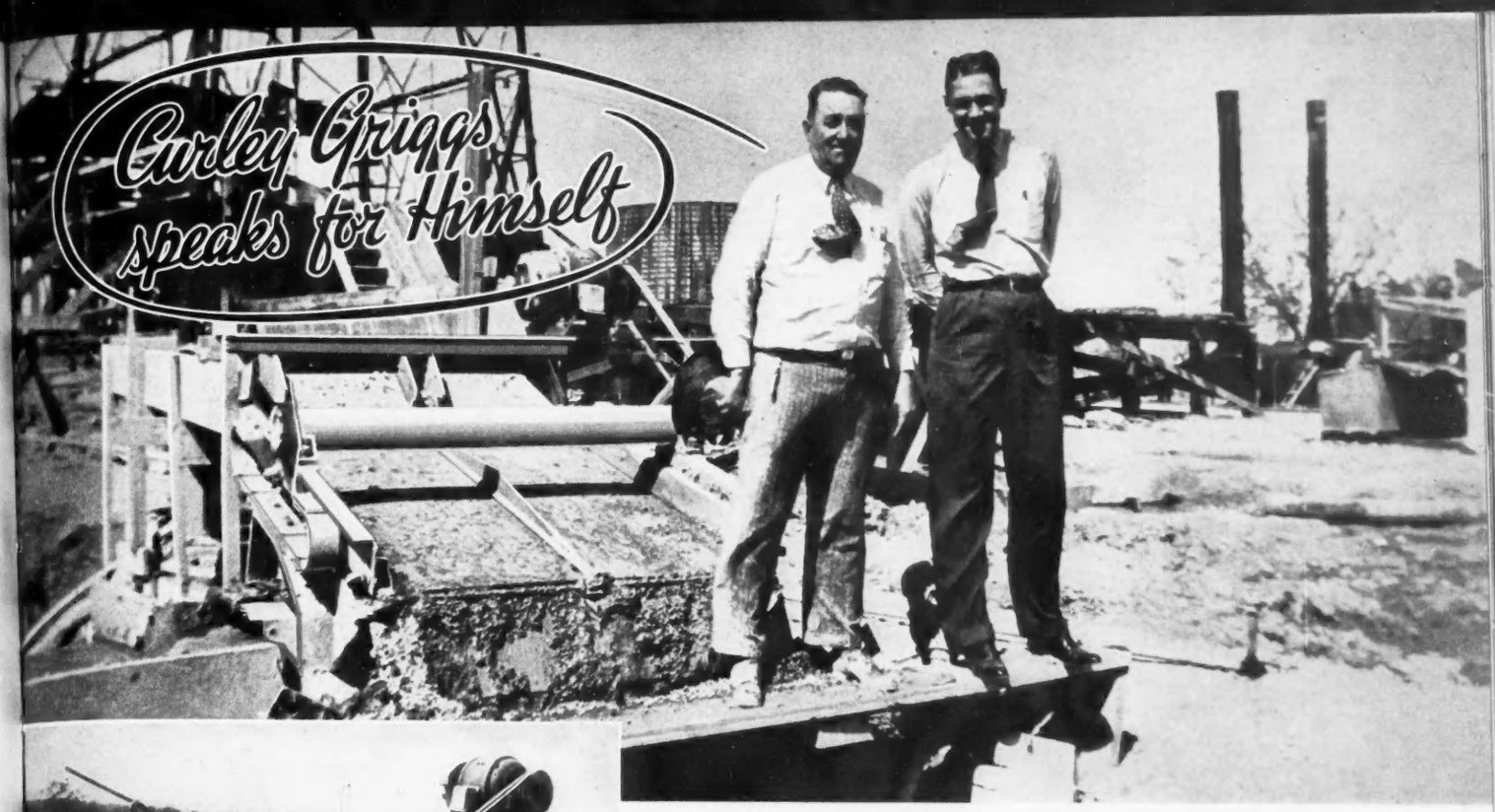
"Big-Inch" Unibolt

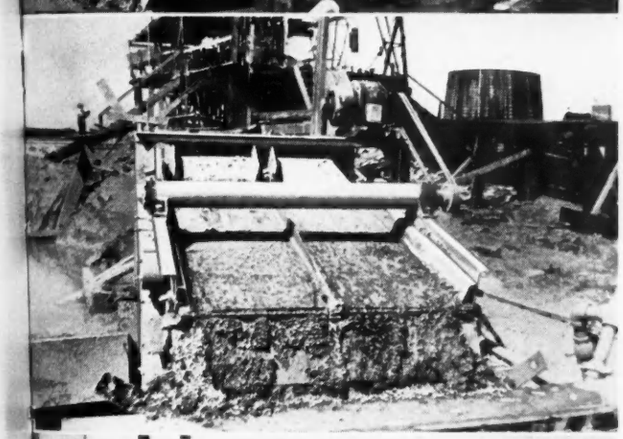
The application of the Unibolt principle to other equipment than a coupling device is also presented in the Thornhill-Craver exhibit.

Standco Bolt Company

▪ *Bolts*

Standco Bolt Company, Houston, is displaying its line of heat-treated alloy-steel oil field bolts in the Houston Oil Field Material Company section.





And other mid-continent Contractors ON

VIBRATING SCREENS

● Curley Griggs of Allen & Griggs Drilling Company, Fittstown, Oklahoma, knows what he's talking about on the subject of Vibrating Screens. He knows what they've done to make drilling easier, safer, and less costly... and he doesn't generalize in his praise of screens. He singles out LINK-BELT and calls it the proven screen that he can and does recommend 100%.

When this widely experienced contractor opens up on what the LINK-BELT Vibrating Screen is doing for his company he's pretty well speaking for contractors in general throughout the Mid-Continent territory. You'll find that contractors prefer the LINK-BELT Screen for its consistently better performance and dependability.

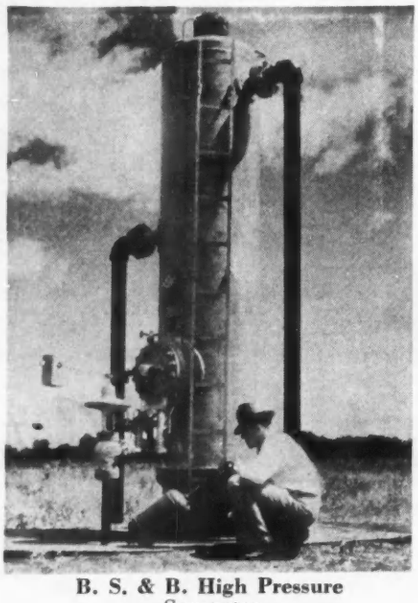
The Allen & Griggs location shown above is the fourth hole for this Link-Belt Screen. The Screens at left were photographed at random from the hundreds of Link-Belt Screens operating in Mid-Continent fields.

Link-Belt Company, Philadelphia, Indianapolis, Chicago, Los Angeles, New York, Houston, Dallas or Tulsa. 7158

LINK-BELT *Vibrating* SCREEN

Black, Sivalls & Bryson, Incorporated

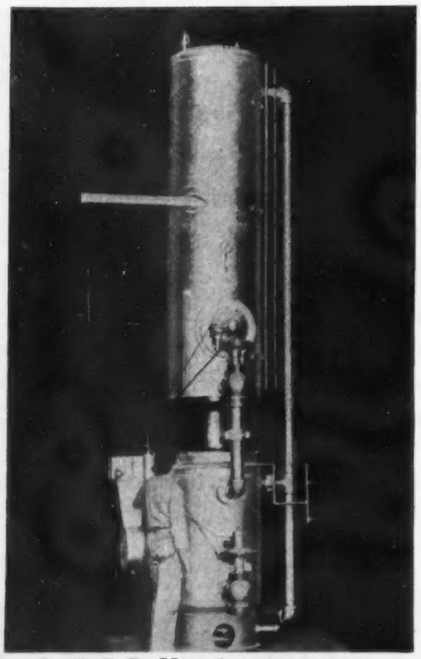
Black, Sivalls & Bryson, Inc., Oklahoma City, is exhibiting in Booths 450-452-454 and 456 in the main exposition building. The exhibit consists of several separators and other equipment.



B. S. & B. High Pressure Separator

▪ *High-Duty Separator*

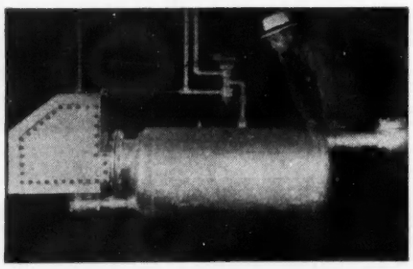
A BS&B high-duty 500-pound working pressure oil and gas separator is in operation, showing how the BS&B Pilot controlled oil valve works. This vessel is an API-ASME code vessel and is stamped with the Hartford Steam Boiler Inspection and Insurance Company's stamp, which is indicative of extremely rigid inspection during fabrication. This vessel has had all seams X-rayed in order to assure perfect welding on all seams.



B. S. & B. Metering Separator

▪ *BS&B Metering Separator*

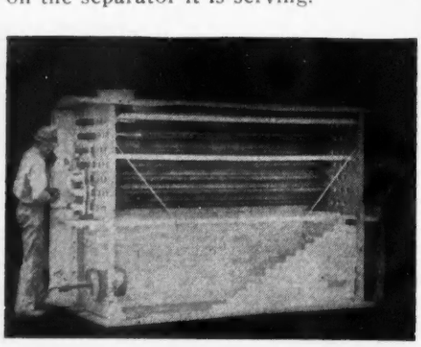
The BS&B metering separator also is a working exhibit. It separates the oil and gas, then meters the oil. It is practical for every field condition where it is desired to have oil metered. These metering separators are usually used where a great number of wells are flowing into a common central separator and provides means of by-passing one well at a time to the meter separator to obtain accurate individual well gages without the necessity of typing up a portion of the tank battery. After the oil has passed through the metering separator it is dumped again into the regular stream of oil from the central separator to the tank battery.



B. S. & B. Automatic Blow Case

▪ *BS&B Automatic Blow Case*

The BS&B automatic blow case, which is in full operation, is a new automatic device that utilizes an outside source of gas pressure to boost oil to stock tanks from a separator working on a low pressure or under a vacuum. Fundamentally it is a small horizontal cylinder having a large internal float which actuates an unique three-way valve which will admit, or discharge, gas from an outside source to move oil from the blow case chamber to the stock tanks without causing any pressure whatsoever to be built up on the separator it is serving.



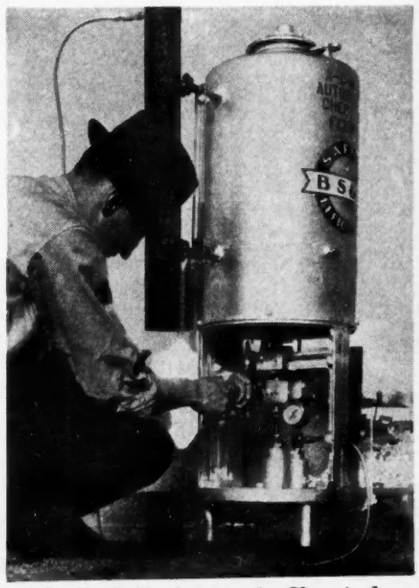
B. S. & B. Tubular Heater

▪ *BS&B Tubular Treating Heater*

This new tubular heater for use in the process of treating crude oil emulsion is built like an up-to-the-minute refinery pipe still. Runs of common 2-inch pipe are folded back and forth into a compact heat absorbing bundle. A novel, two bolts, flexible joint U-bend is used to connect the ends of the runs of the 2-inch pipe in order to make this heater either a single pass heater of 40 tubes or two parallel coils of 20 tubes each. An efficient high-pressure gas burner fires beneath the heating tubes. A special long bulb thermostat in the last pass accurately controls the heat. The common brick setting can be laid up dry. A sheet metal weather housing with stack bolts overall. One of the outstanding features of this tubular heater is the ease with which new tubes may be added in case of corrosion or scaling. The 40 tube heater has a heat input rating of 1,500,000 B.T.U.'s per hour, enough to raise the temperature of 84 bbls. of oil per hour through 100° F.

▪ *BS&B 3000-Pound Working Pressure Separator*

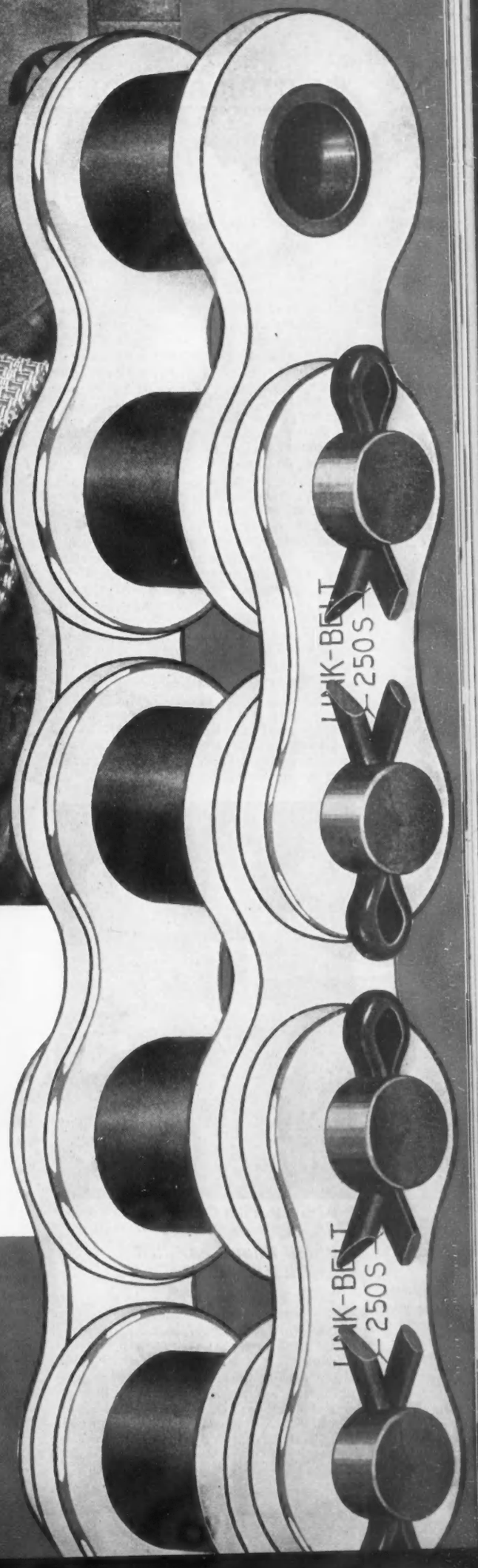
BS&B is showing a partially fabricated extra high pressure (3000-pound working pressure) API-ASME code oil and gas separator. The top head is removed to enable visitors to see and examine the extreme thickness of the shell and head material as well as the inter parts of this extremely high working pressure separator.



B. S. & B. Automatic Chemical Feeder

▪ *BS&B Automatic Chemical Feeder*

The new BS&B automatic chemical feeder is a gas powered unit designed for efficient injection of treating chemical into lines carrying emulsified crude. It is easily connected and put into operation, and is entirely automatic in operation, thus requiring very little attention. It operates on low pressure gas and will, with 25 pounds gas pressure, deliver chemical against pressure as high as 4000 to 5000 pounds per square inch. This automatic chemical feeder has no rotating parts and requires no lubrication. Its ability to deliver chemical against such high pressures permits injection of treating chemicals ahead of the choke of the highest known well pressure. The new BS&B automatic chemical feeder is



● Ready for shipment . . . this modern heavy-duty portable drilling rig is going to a major drilling contractor, for service where the digging is hard and the holes are deep. On these jobs they must have consistent performance, with minimum shut-downs.

This rig is equipped 100% with **LINK-BELT** double width Silverlink Roller Chain (2-½" pitch RCD-250S), and **LINK-BELT** Sprockets.

Silverlink Roller Chain is the Standard among roller chains today with the majority of Drilling Contractors and Producing Companies throughout the rotary fields of the world.

Link-Belt Company, Indianapolis, Philadelphia, Chicago, Los Angeles, New York, Houston, Dallas and Tulsa.

7186

See our Exhibit—Houston Oct. 11-16

LINK-BELT

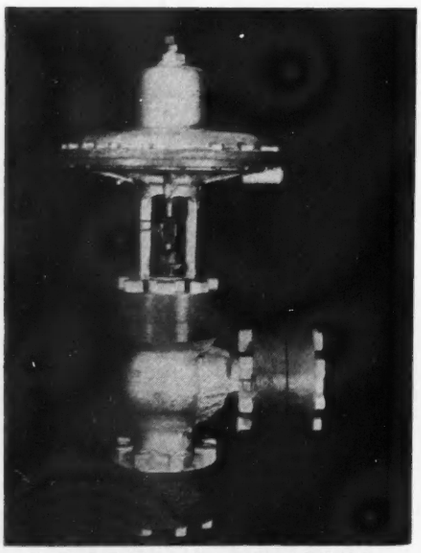
Silverlink

ROLLER CHAINS

entirely self contained. The chemical reservoir, pump and its motivating parts are built into one neat compact housing.

▪ *BS&B Safety Heads*

BS&B safety heads consist of a set of special safety head flanges which tightly clamp the accurate, dome-shaped safety head diaphragm. When the pressure exceeds the safety point, the safety head diaphragm burst wide, relieving the pressure quickly. The safety head flanges can be permanently attached to pumps, separators, pressure vessels, or any device to be protected from too high pressure. A relief line attached to the discharge valve of safety head flanges can pipe valuable contents away to emergency receptacles. The safety head diaphragms can be made of copper, aluminum, Monel metal, steel, silver, gold—any formable metal, as required to protect against chemical reaction or corrosion. Safety head flanges are carefully tested for required bursting pressure and are guaranteed to burst within five percent of the pressure stamped upon them. In addition its accurate bursting point, a prime feature of the safety head is its enormous relieving capacity. One four-inch safety head will equal 32 two-inch safety valves. Only the safety head diaphragm "goes out," when the pressure is relieved. The safety head flanges remain intact. Merely remove the top flange to install a new diaphragm, just like renewing an electric fuse, and comparatively just as inexpensive.



B. S. & B. Pilot Controlled Oil Valve

▪ *BS&B Pilot Controlled Oil Valves*

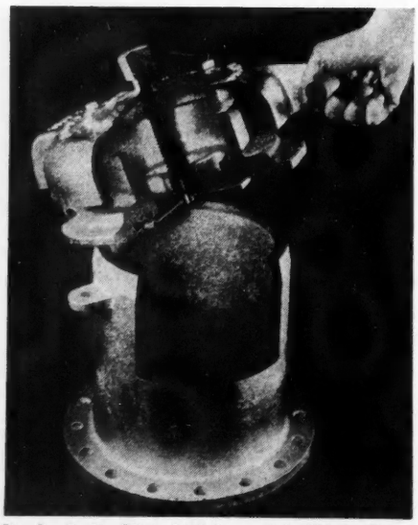
These valves are the single plug and seat type of valve which seal either bottle tight when closed or stroke full wide open when they are supposed to be dumping fluid. This open stroke is always long enough to forestall any possible chance of "wire-draw" or erosion from sand or high fluid velocity. The BS&B master valve is a remarkably simple, rugged, air-break type of rotary valve. It uses no packing—as only two moving parts. Its flat valve slide rotates freely on a flat seat. The pressure keeps it ground tight. It does not wear leaky. It has long, knife sharp port which opens all at once to permit a full slug of gas to the diaphragm —closes all at once to exhaust it equally fast. Plugs and seats of various sizes are interchangeable in the high pressure type valve and are quickly and easily reached in case a change of size is desirable.

▪ *BS&B Oil Sampler*

This New BS&B oil sampler is a small device which operates off the master pilot valve for the purpose of taking from the inlet line of the separator a very small sample of the fluid entering the separator each time the pilot valve on the separator discharges fluid to the tank. This permits a two-gallon or three-gallon sample to be taken over a 24-hour period in order to give a close approximation of the amount of water and oil entering the separator during the test period.

▪ *BS&B 3 in 1 Thief Valve*

The base, body and lid of the BS&B thief valve are all of corrosion resistant cast iron. The 10-ounce body illustrated is used for vapor pressure tanks. Other BS&B thief valves are the same design; are weighted to 2 ounces



B. S. & B. Thief Valve with High Base for Wood Tanks

for BS&B gas type wood tanks and API steel tanks; also to 16 ounces for BS&B vapor pressure steel tanks. The vacuum valve is an 18-8 chrome nickel stainless pressed steel, corrosion resistant deck. The vacuum valve stem and spring are also of 18-8 chrome nickel stainless, corrosion resistant steel. The vacuum valve nut and guide are of corrosion proof bakelite. The vacuum and pressure gasket are of Duprene oil sympathetic rubber. The base as illustrated is sufficiently high to clear the 6-inch of deck water on BS&B durable wood tanks.

For steel tanks this base ring is necessarily much shorter but of same rugged design and construction.

▪ *BS&B Safwalk Material and Walkways*

BS&B "Safwalk" walkway material is adaptable to many purposes other than for building safe sturdy runways for production tanks. It is inexpensive yet surprisingly strong material, can easily be cut and fit in the field to suit any walkway problem. Rigid tank car-loading racks can be quickly built from BS&B Safwalk material that are safe, fireproof, long life and almost 100% salvageable for tank walkways if the tank is ever abandoned. An interesting application of BS&B Safwalk material will be on display at the Sullivan Machinery Company derrick in the Exposition grounds.

National Radiator Corporation, Cast Products Division

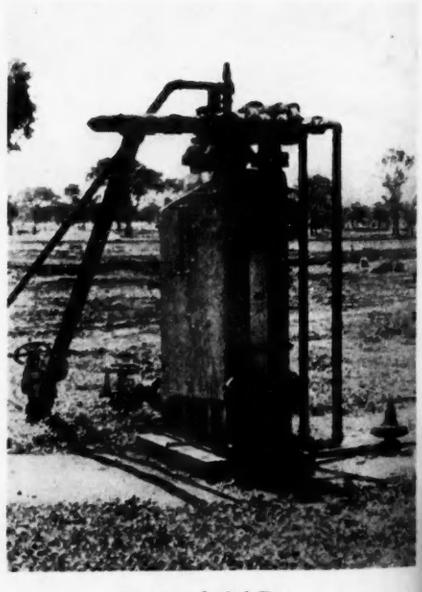
▪ *Oil Treator*

The exhibit of National Radiator Corporation of Johnstown, Pennsylvania, includes a National Oil-Rator for breaking crude oil emulsions or for reducing the viscosity of pipe line oil by the application of heat. The product may be used for treating all types of crude oil.

The Oil-Rator is made of a heat and corrosion resisting cast iron alloy containing nickel, chromium, and molybdenum. It is suitable for gas or oil firing and because of its sectional nature and ease of assembly is adapted to a wide range of capacities.

Operation of the unit is thermostatically controlled and automatic. As a result of the flue passage design, efficiencies up to 80 percent are said to be obtained. The sediment found in many crude oils is readily removed by cleanout openings provided for this purpose.

The savings effected by the National Oil-Rator in treating and pumping costs through economic operation and low maintenance are stressed in the display.



National Oil-Rator

BREWSTER

Wire-Line CORE BARREL

. . . bought outright, it will cut your coring costs in half!

Without a doubt the most economical coring method is to buy a Brewster Wire-Line Core Barrel OUTRIGHT. Carefully checked well logs kept by major companies have proven it time and time again.

A certain company saved $430.00 on one well. 42 cores were taken with a Brewster Barrel they had bought outright. Naturally there were a few replacement parts. But the total cost when compared with the cost of the same coring job on a rental basis was found to represent a saving of $430.00—on the **one well!**

Think what a saving this can mean to you.

The Brewster Wire-Line Core Barrel is simple enough to be operated by any driller. Maintenance is low because of the minimum of parts. Drag bit heads for this barrel are set with Tungsten Carbide Hard Metal inserts. Takes cores up to 8 feet in length.

Buy a Brewster Wire-Line Core Barrel outright—and you provide yourself with the most economical coring device known. We'll be glad to quote prices.

THE BREWSTER CO., INC.

PHONE 3181 — **SHREVEPORT, LA.**

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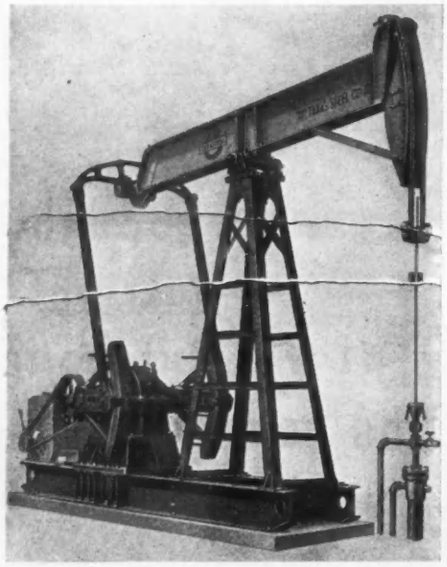
Export Office: ACME WELL SUPPLY COMPANY, 136 Liberty Street, New York City

Texas Steel Company

Texas Steel Company, Fort Worth, Texas, is featuring its new line of oil well pumping units and underpull pumping jacks, the exhibit being of such proportions as to require the use of both inside and outside space. The outside space is devoted to the presentation of a multiple well hook-up in operation.

▪ *Pumping Units*

The Texasteel line of pumping units, two of which are being exhibited, includes units rated at from 6000 to 25,000 pounds polished rod load and providing for strokes from 24 to 74 inches. Features of the design are a rigidly welded skid-type base, extended to



Texas Steel Company Pumping Unit

provide space for the prime mover; four-leg rectangular base Sampson post; equalized double pitman; helical gear double reduction speed reducer; and rotary type, laminated weight counterbalance. All bearings are dirt and dust proof, greased packed stuffing box, packing gland type.

▪ *Pumping Jacks*

Underpull pumping jacks ranging in size from 2,500 to 25,000 pounds polished rod load capacity, straight lift strokes from 30 to 74 inches, dirt and dust proof, grease packed, stuffing box packing gland bearings, adjustable side braces and alignment provisions.

▪ *Backside or Stroke Post Assemblies*

Three sizes of equipment designed for multiple well pumping on the same prime mover. Bearings are dust and dirt proof, stuffing box packing gland type, Alemite fitted. Double roller bearing wrist pin bearings, utilizing split socket principle for alignment and load distribution.

▪ *Sucker Rods*

Four types of electric furnace steel sucker rods, of widely varying physical and chemical properties to meet a multiplicity of well conditions. Made in pin and pin and box and pin styles under rigid adherence to API specifications.

▪ *Pull Rods*

Three types of high tensile pull rods in sizes from ¾ to 1 inch.

▪ *Friction Equipment*

A complete line of swings of any desired angle, roller type and pendulum type hold downs and hold ups, hold overs, etc. Swings and hold overs are equipped with dirt and dust proof, grease packed, stuffing box packing gland type bearings, Alemite fitted.

▪ *Miscellaneous Equipment*

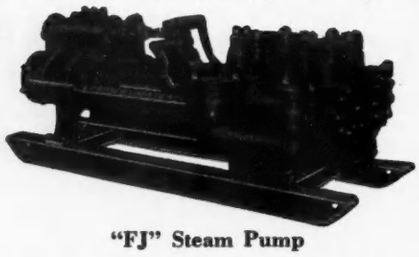
Tubing heads, stuffing boxes, bull plugs, straight and swaged nipples, couplings, etc., are displayed also.

Gardner-Denver Company

Gardner-Denver Company, Quincy, Illinois, is exhibiting a new 10x4½x10 "FJ" high-pressure boiler feed pump, an improved single-stage roller-bearing, horizontal air compressor, a 4-inch type "F" horizontally split case centrifugal pump and a 4½x6 "FXG" Power Pump.

▪ *"FJ" Steam Pump*

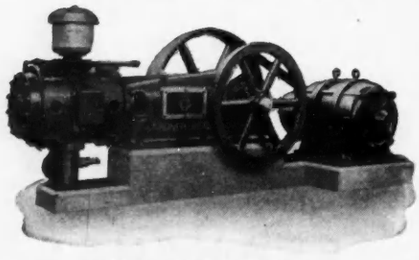
The new 10x4½x10 "FJ" steam pump is designed for high pressure boiler feed service. It is compact and streamlined, which makes it well suited for unitization. Valve pot type fluid cylinders are featured with valves in individual compartments, steam cylinders are fitted with piston type valves. The pump is designed for rugged oil field service.



"FJ" Steam Pump

▪ *"RX" Horizontal Air Compressor*

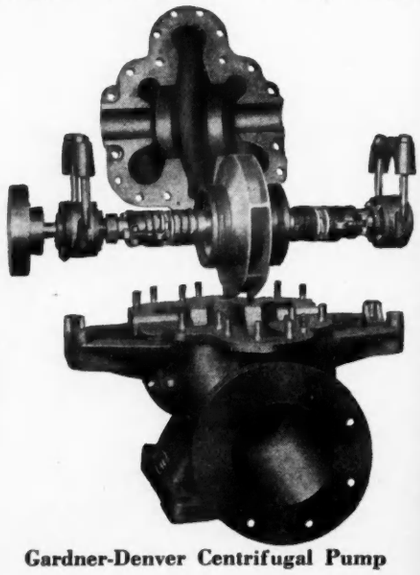
The improved "RX" single-stage horizontal compressor is designed for heavy-duty full-load service and continuous operation. The Electro-Pneumatic Control is an important feature. With this control the compressor always starts unloaded and the air supply is automatically adjusted to fit air needs. The compressor has totally enclosed dust-proof construction without sacrifice of accessibility. Perfect balance and freedom from vibration make the "RX" a smooth and efficient operating machine. Timken tapered adjustable roller bearings are a feature of the compressor.



"RX" Air Compressor

▪ *Horizontally Split Case Centrifugal Pump*

Gardner-Denver centrifugal pumps are built in a completely modern factory with the latest equipment by highly skilled craftsmen. With 77 years of manufacturing experience the Gardner-Denver pumps have been built as the standard by which other pumps are judged. The pumps are single-stage high efficiency pumps, designed for heads up to 300 feet. The impeller is of cast bronze, totally enclosed type. The casing is of cast iron horizontally split at shaft center. Heavy duty, single row ball bearings are featured. The entire pump is designed for modern rugged service.



Gardner-Denver Centrifugal Pump

▪ *"FXG" Power Pump*

The "FX" Duplex Power Pumps feature valve pot type fluid end. The Herringbone gears of the pumps operate in flood lubricated power ends. Durable light weight valves are used. Two side suction openings are provided so that suction pipe may be connected to either side. The pumps are designed for use in oil line and industrial service and are widely used in oil fields for supplying water to drilling rigs. The three-inch and six-inch stroke pumps are designed along the same general lines as the Gardner-Denver "FX" 10-inch stroke pumps.

"FXG" Power Pump

"THAT'S WHAT I LIKE ABOUT Eastman!"

A TYPICAL OPERATOR SAYS:

"I ordered Eastman to make a Directional survey of an 8000-foot well. The driller had instructions to be out of the hole at midnight, and ready for the survey. This morning's report proves to me that Eastman really knows how to get the job done. Started in the hole at 12:30 A. M., on bottom at 6:00 A. M. Circulated 30 minutes and out of the hole at 10:00 A. M. At 11:30 A. M. I had a phone call from the Eastman Engineer in the field giving me the angular condition and general direction of the hole, and at 7:30 P. M. a special messenger delivers me this complete and finished report showing me the actual course of the hole underground. I get the finest possible service in the shortest time and at a reasonable price—**That's what I like about Eastman.**

"When you want a quick, accurate, and confidential survey of your well, take my advice—call Eastman."

OIL WELL SURVEY SERVICE — CONTROLLED DIRECTIONAL DRILLING — SINGLE SHOT SURVEY INSTRUMENTS — PHOTOGRAPHIC DRIFT INDICATORS — ORIENTED CORES

HOUSTON OCTOBER 11-16-1937
SEE OUR EXHIBIT
OIL WORLD EXPOSITION

No hole too deep or too small for the Eastman Multiple Shot Survey Instrument shown at right.

EASTMAN OIL WELL SURVEY COMPANY

General Offices: DALLAS, TEXAS

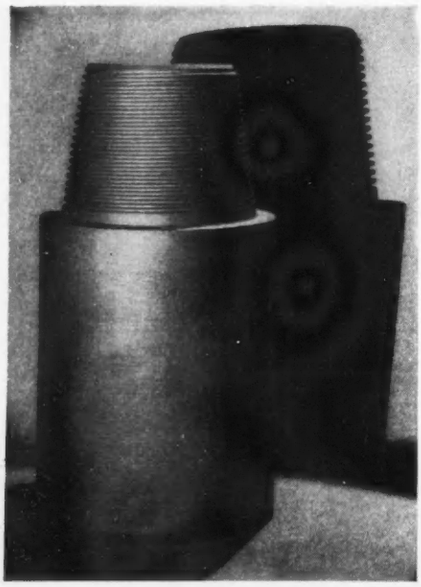
LONG BEACH HOUSTON OKLAHOMA CITY

Hughes Tool Company

▪ ***Drilling and Producing Tools***

Practically all products of Hughes Tool Company, Houston, are on parade in Booths 524, 526, 528, 530, 625, 627, 629 and 631, which are near the center of the main building.

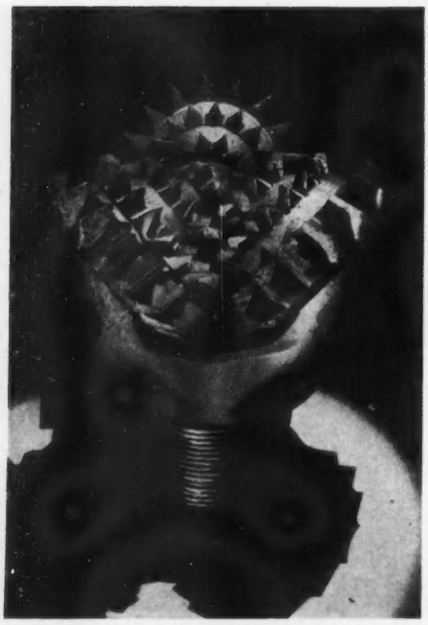
Most of the products displayed feature recent improvements and developments, and are sectioned and illustrated so that



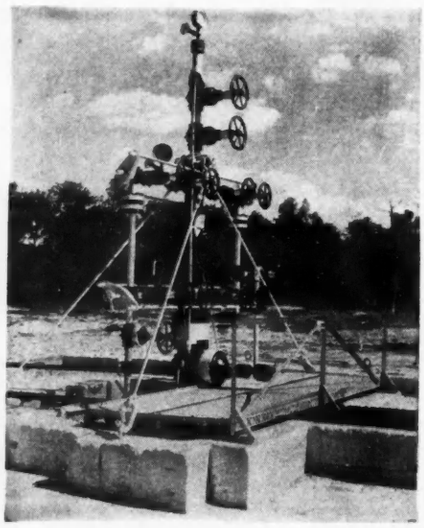
Hughes Tool Joint

interior construction and workmanship may be viewed to best advantage. Working models also are on exhibit of several of the items.

Products exhibited include various rotary rock bits, core bits, tool joints, reamers, drill collars, chokes, tubing and flow

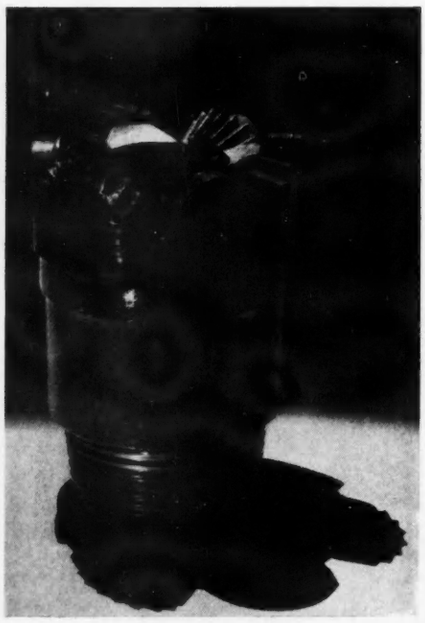


Hughes Tri-Cone Rock Bit



Hughes 10,000-Pound Test Christmas Tree

heads, valves and fittings, complete assembled Christmas trees, plunger lift devices, and other specialized oil industry tools.



Hughes Hard Formation Cutter Head

Dixon Valve and Coupling Company

▪ ***Rotary Hose Couplings***

Dixon Valve and Coupling Company, of Philadelphia, with branches in Houston and Los Angeles, is portraying the history of rotary hose couplings.

Featured is the latest of Dixon's rotary couplings, the "Boss Giant Tri-Duplex" Style Z. This coupling has tested many lengths of rotary hose to and above 10,000 pounds per square inch. Its test record, however, is only secondary to its field performance, which in every instance has won enthusiastic approval.

Dixon is exhibiting also a machine for the insertion and removal of nipples from rotary or other large sized hose, as well as being a rigid vise for the application and further tightening of clamps to hose before it is placed in service. This machine is standard equipment with many of the large jobbing houses and rubber mills.

The Tnemec Company

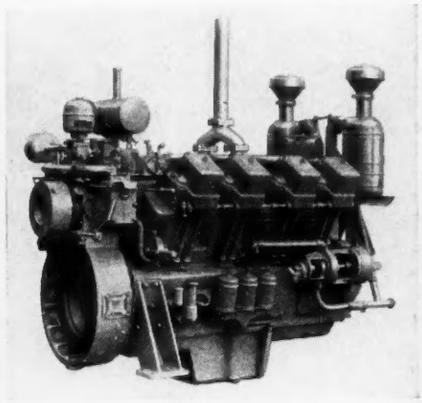
▪ ***Coatings***

The Tnemec Company, of Kansas City, Missouri, is displaying its specialized oil industry coatings.

Caterpillar Tractor Company

▪ ***Diesel Engines***

Caterpillar Tractor Company, Peoria, Illinois, display at the Houston Show consists of Diesel engines ranging in size from 44 to 160 horsepower.



Caterpillar Diesel

The "Caterpillar" Diesel engine is distinguished by its simplicity, ruggedness and economy of operation. Seven sizes of engines are manufactured by the company, the smallest a four-cylinder model, turning at 1400 revolutions per minute; and the largest, a V-8, turning at 850 revolutions per minute. The fuel injection system requires no adjustment, timing or other skilled attention. The pumps, which are interchangeable on all the larger models are designed to provide sufficient pressure to inject the fuel and accurately measure the amount of fuel to be injected. The "Caterpillar" Diesel injection valves employ no mechanical means of opening. Each valve which is lifted solely by the pressure ot the fuel, created by the fuel injection pump, is held in its seat by a spring.

Seals protect all working parts of the engine from dust. Lubricating oil and fuel oil are cleaned by highly efficient filters; and a big-capacity air cleaner assures clean air for combustion. The engines are used widely in the oil fields for drilling and pumping purposes.

Standard Seamless
An Exclusive Product of SPANG, CHALFANT & CO., INC., Pittsburgh, Pa.
SALES OFFICES: BOSTON NEW YORK PITTSBURGH ATLANTA CHICAGO ST. LOUIS TULSA HOUSTON SAN FRANCISCO LOS ANGELES
Tubing
Regular and Upset
Unbeaten for accuracy
Line Pipe
A hit in any field
Still Tubes
Low Carbon and Alloys
Record holder for performance
SINCE 1840

Gearench Manufacturing Company

▪ ***Tongs and Wrenches***

A complete line of tongs is being shown in the exhibit of Gearench Manufacturing Company, Houston, manufacturers of more than 25 different types of tongs and wrenches, and more than 350 different sizes. A description of the producing and pipe line equipment the company is displaying follows:

Petol tubing tongs stabs on and off with no hinged members to latch or unlatch. The jaws open and grip the tubing automatically. They are equipped with special cam lever lock, which prohibits the tongs falling or being knocked off, and also permits backing off the tubing without reversing the tongs. Three high-speed steel bits, which are securely held in place by lock wedges, reduce the depth of the bite, and a mechanically limited jaw closure prevents crushing.

Left to right: Petol Tubing Tong; Pipe Tong and Welding Tong

Petol pipe tongs are single-handle tongs that are said to be about 35 percent lighter than conventional type "scissor" tongs, and which are put on and removed easily without danger of mashing fingers. They are equipped with two 4-edge high-speed steel bits held in place by quick-change wedges. This type tong has a positive instant grip, ratchets freely and will not crush the pipe.

Petol welding tongs are double-acting tongs rolling the pipe in either direction on welding jobs. Light, strong and extra long handle provides leverage that permits the operator to get smooth regular turning motion which is necessary for uniform welding. This friction-type tong has no teeth and ratchets perfectly. One-piece non-spreading jaws are quickly interchangeable to handle various sizes of pipe.

Petol stabbing tongs are a light, durable convenient tong for the "pipe liner" to spin up the pipe. Each tong will fit several sizes of pipe and will ratchet or turn pipe in either direction without removal. The tong is applied and removed easily, and the jaw is furnished with replaceable, hardened steel teeth inserts to insure low maintenance cost.

Petol Stabbing Tong

The design of Petol fitting tongs permits the operator to use them in very close places on fitting work, and also on very narrow flanges, etc. They permit smooth ratcheting action and will not jam or lock on the job. They are equipped with hardened steel teeth inserts, which can be removed for resharpening or replacement easily. These tongs are chrome-nickel steel, and are furnished with heat-treated Petol special chain.

A simple but convenient tong on flange work is the Petol flange tong, designed to ride on the flange without danger of slipping off. The pin, which fits in the hole of the flange, is made of chrome-vanadium steel, hardened and tempered, and is easily removed when replacement is necessary. Each size tong will fit numerous sizes and kinds of flanges.

Left to right: Petol Flange Tong; Carrying Tong and Fitting Tongs.

Petol carrying tongs grip and hold the pipe when the handles are in a horizontal position, and can be folded together easily to occupy a minimum space when not in use. Handles are made with smooth round eccentric ends, which eliminate danger of hands slipping off. Strong, rugged and durable these tongs are light and easy to handle.

Petol machine tongs are convenient as a back-up on pipe line jobs. One piece jaws are fitted with replaceable steel teeth inserts. Each tong will handle many sizes of pipe and provide positive grip, perfect ratcheting, non-crushing and non-jamming action.

Left to right: Petol Machine Tongs and Pipe Wrench

The Petol pipe wrench is a new style one for pipe work. A unique design allows instant application and removal. It is self-adjusting and has no nuts to turn or jam. To apply it is necessary to simply bump the upper jaw lightly on the pipe. It cannot be frozen to the job, and the tendency to mar the pipe has been reduced to a minimum.

Pyrene Manufacturing Company

▪ ***Fire Extinguishers***

Several new fire extinguisher products feature the exhibit in Booths 617 and 619 of Pyrene Manufacturing Company, Newark, New Jersey.

A new Phomaire stationary system and two Phomaire play pipes, foam-making water nozzles for producing large quantities of foam with a minimum water supply, are shown. This method of making foam mechanically rather than chemically utilizes a special solution which together with air is drawn into the water stream.

Also on display is the new Hydrogarde water type and Wintergarde anti-freeze type extinguishers, both of which expel their liquid contents by means of pressure from a small carbon

dioxide gas cartridge within the extinguisher.

Pyrene's standard line of hand and wheeled fire extinguishers of the vaporizing liquid, foam, soda-acid, and anti-freeze types as well as corbon dioxide equipment of its associate C-O-Two Fire Equipment Company, Newark, N. J., are displayed.

▪ *Tire Chains*

Standard, extra heavy and "double-duty" bar-reinforced Pyrene tire chains will also be exhibited. Pyrene has detailed information but is not exhibiting its new Pyrene Power-Driven Chain Repair Machine which removes worn cross chains and replaces them at a speed five times faster than ordinary hand or bench tools.

Service Pattern & Model Works

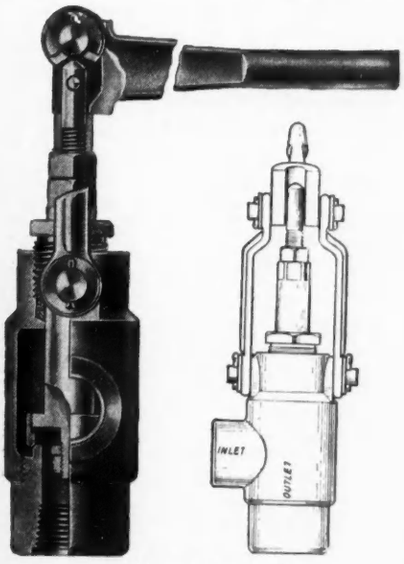
▪ *Patterns*

Service Pattern & Model Works, 4208 Navigation Boulevard, has an exhibit that demonstrates the second phase in manufacturing equipment. On exhibit are various patterns covering both drilling and producing equipment. As an educational feature, a mold and cores that go into the making of a Reed Sport Model Bit Head are on display.

American Iron & Machine Works Company

▪ *American Release Valve*

The latest product of American Iron & Machine Works Company, Oklahoma City, Oklahoma, is the American release valve, and is among its items on display. It is made with a piston and rubber composition valve and steel seat that does not have to be brought into

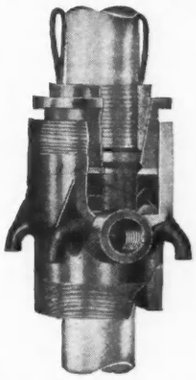


American Release Valve

a shop to be worked over. If the valve comes off, the bottom part is replaced and composition rubber valve replaced in retaining ring. The American release valve is designed so that cutting is practically eliminated.

▪ *Casing Suspender and Blowout Preventer*

This device was developed for use in fields where high pressure is a hazard and where there are more than one oil sand. It is possible to suspend casing at any point in the hole, as lips are full circle and do not cause a crimping, or egg shape, place in casing. Packing consists of three rings of composition packing that is tested for salt water and other ingredients encountered in different oil fields. Fireproof packing is furnished on order.



American Casing Suspender and Blowout Preventer

The American casing suspender and blowout preventer has four tie down lugs cast on the sides to be used with the American tie down flange, or other methods of tying down. It is tested to 5000 pounds.

▪ *American Female Die Nipples*

Quite often a drill stem is broken off where the overshot cannot take hold and the die nipple is then run to take hold. This die nipple is made in steps to take hold of pipe, coupling or tool joint. It is made with either tool box or drill pipe connection on top.

Releasing and Circulating Spear

Female Die Nipple

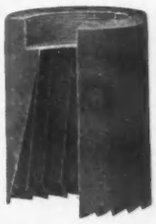
▪ *American Releasing and Circulating Spear*

This spear, made so as to pack off inside of broken drill pipe or casing, will withstand any amount of pressure and, if circulation can be broken through the fish. It is made with a hollow stem for circulation and with a one-piece slip that expands by pulling up on drill stem when hold of fish. In case the fish cannot be pulled, just turn drill stem to right and slips pull away from mandrel and then come on out of hole. Set the slips to the inside diameter of fish to be caught, as the split slip allows same to contract when going into pipe.

This type spear is also popular for catching tubing, as it does not egg-shape pipe, due to the fact that the slips are a full circle. The American Iron spear can be pulled from pipe on the derrick floor.

▪ *American Milling Shoes*

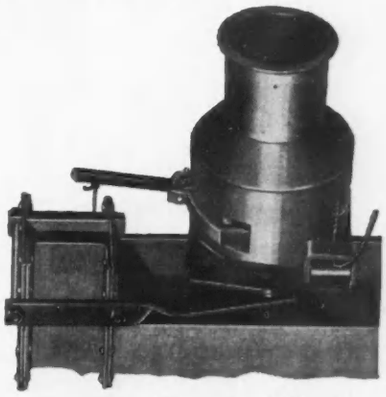
American milling shoes, type E, type F and type D, are made to run on the bottom of the American overshot. The type F milling shoe is used where pipe or tool joint is broken off, leaving a rough edge. The type F milling shoe is to mill out junk that might be on outside of fish, or to wash over fish in case of tight hole. Where the pipe is in a cavity and wall hook cannot straighten it, American Iron milling shoes can be run on bottom of overshot to mill over the pipe and at the same time overshot will take hold of the fish.



Milling Shoes

▪ *American Automatic Cathead*

The American automatic cathead is composed of only nine parts, five of which are working parts. These parts are made of the best material obtainable to withstand hard usage.



American Automatic Cathead

The cathead has four point contact, that is, it takes hold on quarter turn of shaft and releases on complete revolution of the shaft. It has a 36-inch stroke, and if tongs are in good condition, will break joint with first contact. The spool is bored to fit any size shaft up to and including 7½ inches. It is keyed on line shaft and fastened over header board with brackets, that allows cathead to be pulled any time, or can be moved with line shaft without removing from same.

▪ *American Side Tracking Mills*

American side tracking mills are made of fine grade steel. They are used where a whipstock has been run and where milling through pipe or casing is desired. They may also be used on col-

lar that catches splinter of casing that is milled out, thereby bringing splinter out and not having to mill same up after the job is completed.

▪ *American Myracle Sucker Rod Socket*

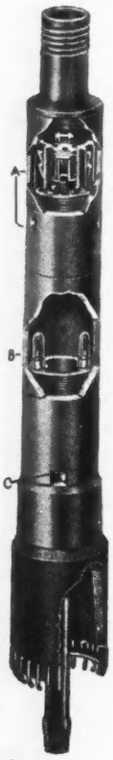
Made with die nipple effect to catch pin that might be broken off in box or in upset. It also has slips to catch size sucker rod that is in use in different sizes of tubing.

▪ *American Flowing and Pumping Packer*

This packer is run on tubing and is designed to allow fluid to pass through packer while running and does not have to be snubbed in, due to the equalizing of pressure. It has a tapered cut that seals to the wall of casing from absorption of fluid and pressure. In running, if the well is flowing or flows by heads, use a tubing oil saver, in that way flow can be diverted through casing to tanks.

When ready to set, a bolt about one inch by two feet long is dropped down tubing to break disc that holds up "A" valves, and then all oil on outside of tubing will drain back through "A" valves and leave outside of tubing dry.

When packer is to be pulled, there is no oil to combat, no mechanical appliances on packer to sand or corrode up. If well is about to be pumped, a common barrel is run below packer, run rods in and hook on the pump. This has, in most cases, allowed well to be pumped a few minutes and then they will flow balance of production. The well may be flowed by artificial pressure by forcing pressure down inside of casing and returning through "A" valve. It is suggested that a bull plug be placed on bottom joint and that joint be perforated and set near oil sand. Gas comes up through "B" valves and meets fluid at point in tubing and helps flow the well.



American Flow Packer

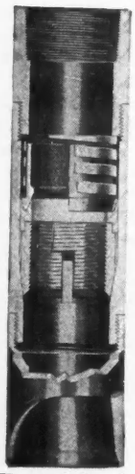
American Forged Steel Sub

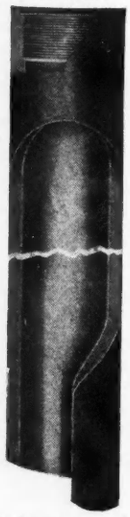
▪ *American Forged Steel Subs*

These subs are made in three types. Type G and H to be used with overshot to connect from casing to tool joint. Type K is used for connecting up different sizes of pipe. American Iron & Machine Works Company also makes subs for kellys and other connections that might be made on a drill stem. The Type H sub is long enough to allow elevators and slips to take hold at the same time.

▪ *Releasing and Circulating Overshot*

The American releasing and circulating overshot takes hold of fish, drill pipe or tool joint, and the rubber packer fits tight against fish, thereby allowing circulation through the bit, if it is possible to get circulation. In case fish cannot be pulled overshot can be released by letting tension off the drill stem, rotating to right about 10 times, pick up on pipe about two inches, then rotate to right and repeat until slips turn loose. Slips can be furnished for any size pipe or tool joint. This overshot can also be supplied in left hand type for backing off drill stem.


Forged Steel Wall Hook


Releasing and Circulating Overshot

▪ *American Boltless Hose Coupling*

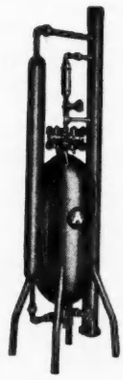
This clamp consists of three wedges, three segments and one coupling, or nozzle. It is made with a wedge effect, preventing cutting of hose. Should the clamp work loose, a sledge hammer may be used to drive it on the wedge, thereby tightening. The nozzle is made of steel, treated to withstand a great deal of pressure and cutting.

American Hose Coupling

▪ *Fishtail Bit*

This bit was first made for use in fields where gumbo or soft formations were predominant. During the past two years, it has been used on chalk and other hard formations. This was made possible by using different welding compounds.

Water courses at cutting edge allow lubrication at cutting point, thereby preventing burning of bit. Reaming edges, which are well built up, allow bit to ream as it digs, thereby making a straight hole, as well as doing away with extra trips to ream. American fishtail bits are made long enough to permit plenty of dressing.



▪ *American Drill Pipe Float*

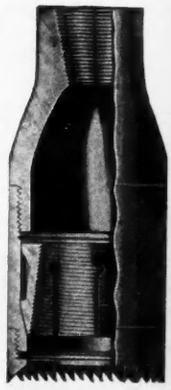
This is a drill pipe float designed to run in the string of drill pipe to break the fall of pipe, in case the pipe should part or break. It is also used for floating drill pipe into the hole. The American float is made so that the assembly can be milled out in case of stuck string, and then go down to top of fish and try to circulate.

▪ *American Steam Lubricator*

The American steam lubricator is made in 12-gallon size. It lubricates both engine and pump from one point. It is placed on the steam line near the boilers.

▪ *American Cone Fishing Socket*

This tool is made to catch worn or broken cones that cannot be caught with the cone fishing basket, which is made from a piece of pipe. The American cone fishing socket is made with slips placed in the bowl on a taper, bottom milled to cut any shale or boulder away and core ahead, forcing cones into the slips.


Rock Bit Cone Fishing Socket

▪ *American Paraffin Bits*

This tool is made to run on sucker rods for use in tubing, but can be used on sand line by putting on socket and placing two or three polish rods for sinkers. It is also made in casing sizes with cable tool joint as per order. The

TOOLS *at the* OIL-WORLD EXPOSITION HOUSTON, OCT. 11-16, 1937

Hughes Tool Company's display will be in the main Exposition Building — Spaces: 524-526-528-530-625-627-629-631.

BITS - TOOL JOINTS - VALVES

wings fold up going into the hole, but in coming out they embrace the wall of tubing or casing and clean out the pipe. New wings can be ordered and put on in any shop or at location.

▪ *American Rotary Shoes*

These shoes are made to run on casing for washing over a stuck string of pipe. As a general rule, one or two joints of casing are run with a rotary shoe on them and then the top is snubbed from casing to drill pipe. In some places, more joints are run but as this is dangerous, it is suggested that an inside pipe cutting job be performed first and then over the fish that is left in the hole.

▪ *American Tie Down Flange*

This flange is placed between two flange gate valves. It is grooved to fit any type valve, shortens hook-up by eliminating casing nipples between valves. It also does away with connections between valves. It can be furnished bored to fit over casing to use as casing clamp.

The ends of these flanges are made so as to tie down with either stirrup bolts or tie rods. They are tested to a pressure of 10,000 pounds, but have tensile strength in excess of 100,000 pounds.

▪ *American Tapered Taps*

This tap is used to catch pipe that is so broken that the overshot cannot take hold. It is made in three graduated steps where it will catch drill pipe, tool joint, upset in tool joint or drill pipe. The tap will bend before breaking. These taps are constructed with a hole large enough to allow circulation in case it is needed.

▪ *Long Drill Collars*

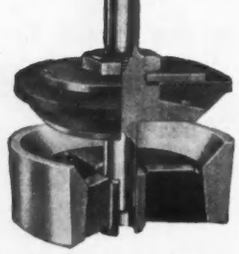
These collars are designed to help prevent twist-offs, crooked holes and unnecessary costs from plugging back. Made of extra tough alloy steel which is heat treated from end to end in one operation. Helps in drilling straight hole by holding drill stem rigid and firmly on its course. Made in wide range of sizes to meet any drilling requirement.

▪ *American Rocker Arms*

American rocker arms eliminate the need for rollers and other wearable parts. Piston rods can be rotated to prevent pistons from wearing on one side. Plunger runs in oil bath. Dust, sand, mud and grit proof.

▪ *Slush Pump Valve and Seat*

These are designed to eliminate trouble caused by cutting out. Only a few parts, all which are scientifically designed and developed to assure positive performance, longer life and satisfactory service—at all times and under all conditions. The cross members are undercut to prevent abrasive substance from fouling seat.



Slush Pump Valve

Long Drill Collars

Tapered Tap

▪ *Safety Packing Flange*

Designed for use on high-pressure wells where there is danger of sand or other substances cutting out the connection where gate valve is screwed on the oil string. Especially developed for use with flanged end gate valves but can be used with screwed end gate valves by using special clamps, furnished as extra equipment. Has stuffing box arrangement equipped with packing, which forms a pack-off around casing by adjusting the flange bolts. Made to withstand extreme pressure.

Safety Packing Flange

▪ *Pumping Well Christmas Tree*

The American Well Christmas tree requires only two connections on original installation; namely, where Christmas Tree is screwed on to tubing, and lead line to flow tanks, thereby eliminating leak hazards.

All parts are in one compact body, which includes check valve, self-lubricating stuffing box and bleeder outlet. Saves 12 to 14 inches in height with this hook-up, which allows ample room for long stroke, without raising pumping equipment. Body is made of best grade cast steel capable of withstanding severe usage.

▪ *Paraffin Scraper and Sucker Rod Coupling*

A dependable tool that is strong, safe and durable. Valuable for keeping paraffin out of tubing; as guide for crooked holes; to take whip and slap out of rods; to prevent worn string of tubing; to help eliminate pulling rods. Insures perfect drop of traveling valve. One piece, special heat treated alloy steel.

Sucker Rod Coupling and Scraper

▪ *American Wall Hook*

The American Wall hook is made to run on the American overshot. It allows the pipe to be straightened and the fish caught at the same time. It is necessary only to take the regular guide off the overshot and screw on the wall hook.

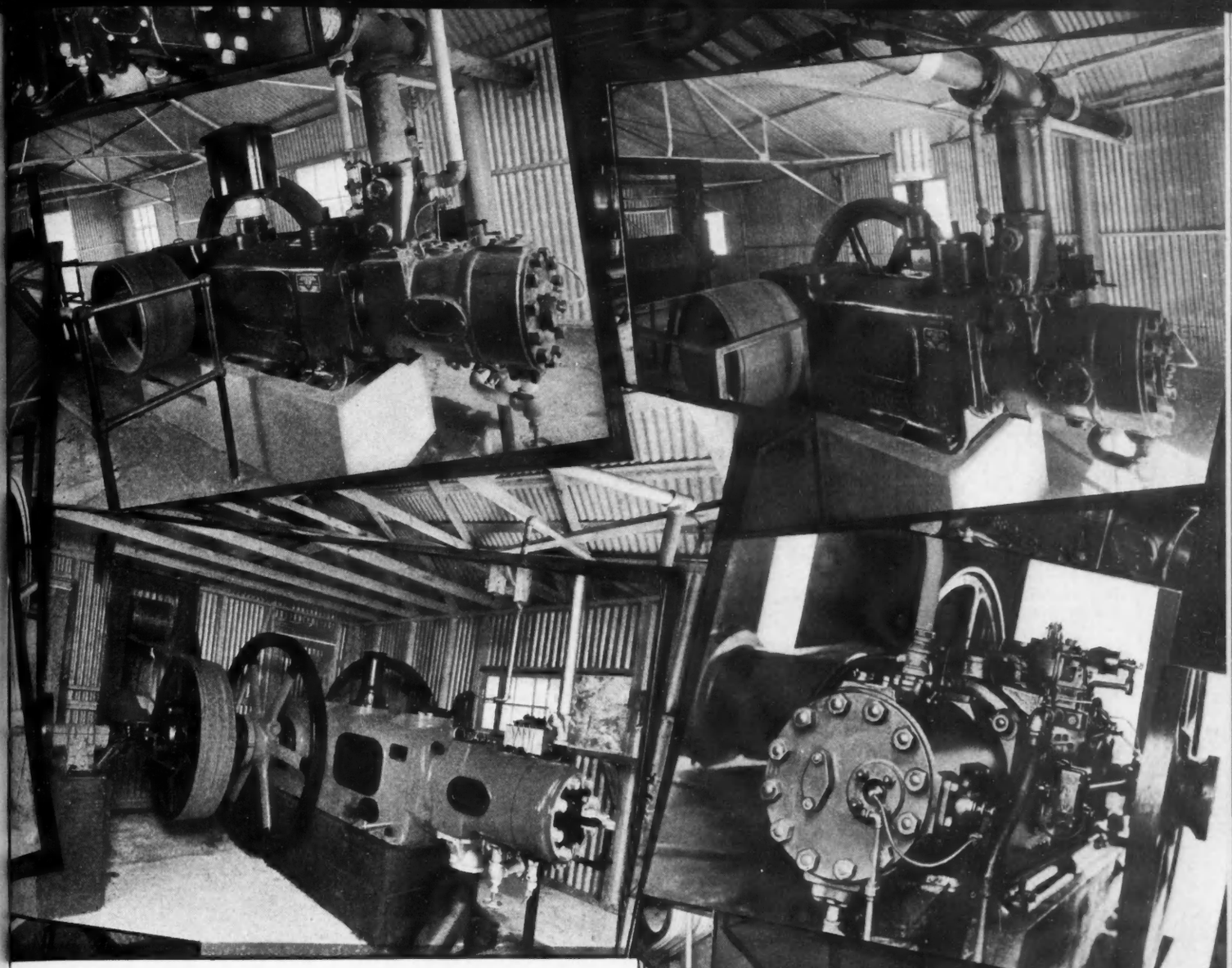
Great Lakes Steel Corporation, Stran-Steel Division

▪ *Portable House*

A complete oil country type portable ready-built house of Stran-Steel is featured in the exhibit of Great Lakes Steel Corporation, Stran-Steel Division. Low maintenance; easily portable; high salvage; fire, lightning and termite safety are claimed for the house built with Stran-Steel frame unit panels prefabricated with outside and inside finish already applied.

Also featured is the general oil field use of nailable Stran-Steel framing, which is shipped and fabricated like lumber.

Stran-Steel Portable House



Outlast the Fields they pump!

There are scores of Cooper-Bessemer Type-GA pumping engine installations just like these . . . in Texas, Oklahoma, Kansas, Michigan and everywhere! Do you often wonder, "Why this preference for slow-speed, heavy-duty power units?" Well, here's how one producer puts it, "I've tried other types, but now I *know*. I want the toughest, most dependable and longest-wearing engines I can get."

25 West 43rd Street
New York City

Mills Building
Washington, D. C.

640 East 61st Street
Los Angeles, Calif.

201 East 1st Street
Tulsa, Oklahoma

631 Spring Street
Shreveport, La.

Magnolia Building
Dallas, Texas

Esperson Building
Houston, Texas

Midwest Piping & Supply Company, Inc.

▪ ***Pipe and Fittings***

Midwest Piping and Supply Company, St. Louis, Missouri, has the following materials in the Frick-Reid Supply Company exhibit: welding fittings and fabricated pipe.

Allsteel Products Manufacturing Company

Allsteel Products Manufacturing Company, Wichita, Kansas, is located in outside space known as Section 1007, at the northwest corner of Walker and Bagby streets.

▪ ***Mobilhoist***

A new unit, known as the Mobilhoist, is among the products exhibited. It is designed for servicing wells 2000 to 4000 feet in depth. Ford V-8, Buda K-428 or Waukesha MZU gasoline engines are available as prime movers. It is made in both the single and double drum, with or without spudding assembly and rotary table drive attachment or 44-foot to 55-foot telescoping mast.

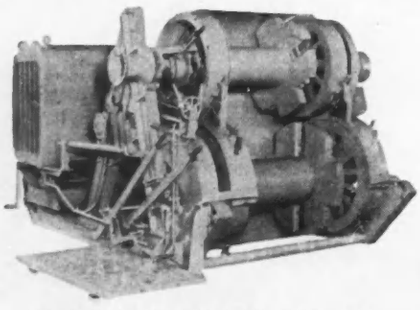
Special features of this unit include friction drum clutches of internal expanding type that are hydraulically operated, hydraulic and auxiliary manual operated brakes on drums, controls located to give operator unobstructed view. It has a road speed of from four to 35 miles per hour.

▪ ***Model R Single-Drum Servicing Unit***

Also on exhibit is a Cardwell Allsteel Model R, single-drum servicing unit powered with Hercules HXE gasoline engine, which is equipped with combination gasoline and natural gas fuel system. Both gasoline and Diesel prime movers are available for servicing wells to 10,000 feet in depth. The unit can be furnished with fireproof accessories to eliminate the fire hazard. Foot operated hydraulic and manually operated mechanical brakes and hydraulically operated cone type friction cone clutch are new features. Controls are located in "drillers position," and make the unit suitable for operation either while mounted on truck or on derrick floor.

▪ ***Model R Double-Drum Draw Works***

Cardwell Allsteel Model R double-drum draw works, which is powered at the Houston Exposition with a Waukesha GAKU gasoline engine, is recommended for rotary drilling from 3000 to 4000 feet, using 4½-inch drill pipe, dependent on size of prime mover purchased. Spudding and beam assemblies are available or can be furnished for mounting in the field after purchase, if desired. With either of these assemblies, this double-drum draw works makes an efficient combination rotary and cable tool drilling unit, and conversion for use with either type of tool can be made in a short time, thereby eliminating cost and loss of time of moving equipment in and out.



Cardwell Allsteel Model R Double Drum Draw Works

Bartlett Hayward Division, Koppers Company

▪ ***Couplings***

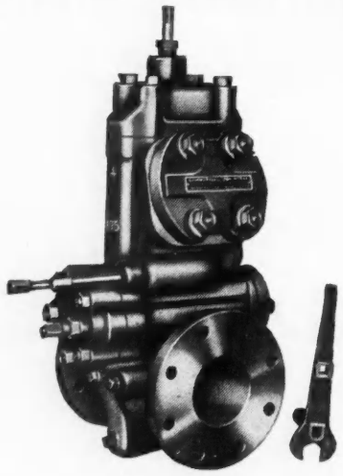
Seven types of Fast couplings are displayed in the booth of the Koppers Company, along with attractive photographs of installations with simple copy.

Commercial Iron Works

▪ ***Fittings***

Commercial Iron Works, 2424 Porter Street, Los Angeles, California, has on display its different types of orifice fittings. Distributors for the company are Foxboro Company and Maintenance Engineering Company.

Among the various types of fittings, the type "CN" orifice fitting is featured, which embodies numerous mechanical improvements that insure speed and ease of operation. Good corrosion resisting materials have been used in all internal parts exposed to the fluid. This design utilizes the non-rising stem multiple thread elevator and lubricant-sealed valve.



CN Orifice

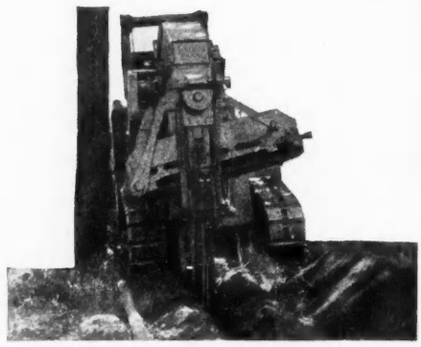
The lubricant-sealed valve is operated by means of stainless steel reduction gears, insuring ease of operation. The body is made in one piece, eliminating joints and gaskets at vital points. Complete accessibility of parts is provided without removing fitting from line. All parts in the flow bore and upper chamber can be removed from the fitting with the line under pressure.

The display also includes the orifice fitting with the rising-stem elevator, the twin-plate orifice fitting containing two orifice plates, and the deadline orifice fitting.

Barber-Greene Company

▪ ***Ditchers***

Barber-Greene Company occupies Booth 1018, and is showing two of the latest B-G Ditchers. They are the Model 54 utility special and the Model 64-B small size ditcher. Both of these models have outstanding features that make them particularly suitable for fast economical ditching in the oil fields both on cross country and gathering line work. The Model 54 utility special ditcher has a special offsetting boom. This means that the boom can be offset while digging to within 2 inches of either crawler, thus enabling trenching within 16 inches of a tree or wall. Its overall width is only 69 inches except for the spoil conveyors (87 inches overall) which can be easily shifted to extend on one side or the other. It is available in two boom lengths to dig a maximum depth of 4 feet or 5 feet 6 inches. Digging width—8 to 15 inches with the 4-foot boom; 12 to 18 inches with a 5-foot 6-inch boom. Its size and speed are ideal for laying airport light conduit, farm and airport tile drainage, and small pipe lines.



B-G Model 54 Utility Ditcher

The Model 64-B small size ditcher is only 57 inches wide overall, yet digs a trench 5 feet deep and 8 to 11 inches wide (3 feet 6 inches deep boom optional). The outstanding feature of Model 64-B is its flexible operation. It has a wide range of digging speeds from 12½ to 104 inches a minute with any one speed immediately available at the touch of a lever centrally located at the operator's platform. The Service Special is especially designed for light fast digging; for laying conduit for electricity, telephone; or shallow gas and water service lines; and oil well or refinery gathering lines.

B-G Model 64-B Service Special Ditcher

Announcing

"PG"

THE NEW DREADNAUGHT *STREAMLINE* TUBING TRAVELING BLOCK

2 SHEAVES — 50 TONS CAPACITY
3 SHEAVES — 75 TONS CAPACITY

This new **DREADNAUGHT** heavy-duty, 48-inch Tubing Traveling Block is designed to handle safely long strings of tubing at high speed. In appearance, this new Block closely resembles the modern streamline drilling block. Heavy construction throughout . . . large diameter center, becket, and bail pins of alloy steel; 1½" cast steel cover plates; ¾" steel separator plates; 2½" forged steel bail; Timken tapered roller bearings . . . gives this Block capacity to spare.

Regularly furnished with solid forged steel bail, but also available with link type bail if desired.

BEAUMONT IRON WORKS CO.

BEAUMONT HOUSTON DALLAS LONGVIEW ODESSA, TEXAS
TULSA, OKLAHOMA

"Selling Through Frick-Reid Stores Everywhere"

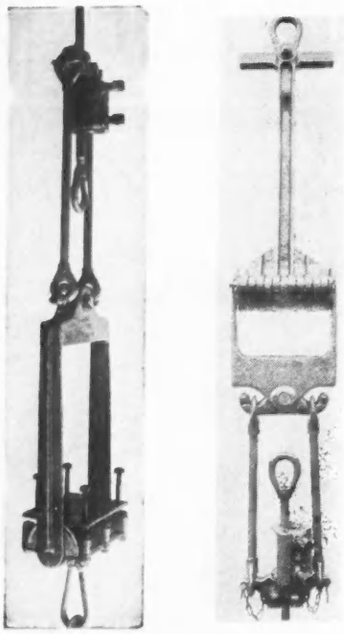
DREADNAUGHT

J. P. Ratigan

Beam hanger equipment and sucker rod line weights are featured in the exhibit of J. P. Ratigan, Los Angeles. A description of the various items follows:

▪ *Beam Hangers*

The No. 115 "Oil-Less" beam hanger with special bearing 13 inches long is a dual purpose hanger designed for underslung beams. It eliminates oiling and also serves to cushion the pick-up on the rods. It also serves as a universal equalizer and self-aligner. The hanger is long enough to rest on the top side of any wood or steel beam, and will handle the longest string of rods.



Left: Ratigan No. 115 Oil-Less Beam Hanger.
Right: Ratigan No. 116 Straight Lift Hanger.

The No. 116 "Oil-Less" straight lift beam hanger is composed of two sections, with a special rubber bearing 13 inches long. These sections are made from electric steel castings and hinged together. This hanger has been pumping on wells using 7000 feet of rods and has worked satisfactorily.

▪ *Pitman Stirrup Bearing*

This stirrup bearing is 13 inches long and is made of a special rubber, which is secured in a steel container. The rubber is exposed at both ends only. The retainer is made in two halves and bolted together, and has means attached to secure it to a wood or steel beam of any make. One-half rubber usually is enough when operating the beam, but two one-half rubbers are provided where the operator prefers such an arrangement. Both bearings are the same and can be used at either end of the beam, as a pitman stirrup bearing or as an underslung beam hanger bearing.

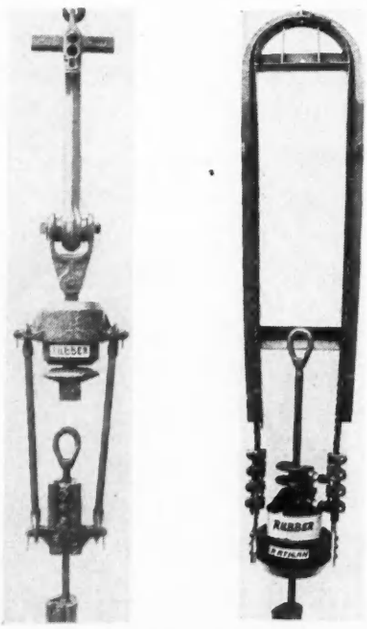
Ratigan Oil-Less Pitman Stirrup Bearing.

▪ *Walking Beam Rocker*

The construction and operating principle of the Ratigan Walking Beam Rocker is such that the beam, through the rocker, is allowed to seek its own course, automatically adjusting itself directly over the well and thus reducing the strain on the polish rod. The base of the rocker rests flat on top of the sampson post, providing a firm base that cannot sag or change because of rotting or settling of the sampson post. This assists in maintaining correct alignment of all beam equipment on both ends. These rockers fit any post or beam.

▪ *Shock Absorber*

The shock absorber displayed is one that can be connected to any old or new Ratigan beam hanger and can be connected in two ways. The rubber container can be turned bottom side towards the beam and connected to the clevis of the



Left: Ratigan No. 111 Shock Absorber in use with Ratigan 24-B Beam Hanger.
Right: Ratigan No. 111 Shock Absorber in use with Ratigan No. 73 Horsehead.

the open face of the retainer is facing toward the beam. When the retaining beam hanger with the rubber attached, to act as an equalizer and a shock absorber at the same time. The retainer has trunnions on its outer sides, these trunnions and retainer acting as a carrier bar when member is face upwards and connected as a carrier bar, the eye shank is eliminated.

▪ *Sucker Rod Line Weights*

These sucker rod line weights are hollow shells which the operator can quickly build up to any desired weight by using sand, scrap iron, babbit or lead. They are equipped with ball bearing swivel and "C" link at each end, the link being opened automatically by a quick-acting safety pin. Various sizes are offered to give the operator any weight combination he needs.

Ratigan Sucker Rod Line Weights.

Volcano Burner Company

▪ *Gas Burners*

Volcano Burner Company, of Houston, Texas, is displaying five types of gas burners.

These are all-steel, low-pressure gas burners for rotary drilling and oil field use—with different types designed for various gas conditions.

The Volcano, Gulf State and Bearcat burners are of similar, unassembled types, which may be assembled and installed in 30 minutes. The Bearcat has a different type burner head particularly adapted for wet gas.

The exhibit features the new Superior-unitized burner, which is on display for the first time. It is the latest development in an assembled gas burner, designed to meet the requirements of the largest oil field boilers. The Superior is shown in two models; the Superior Special—equipped with automatic draft control; and the Superior Standard—without draft regulator.

The Wheland Company

▪ *Drilling Equipment*

The Wheland Company, manufacturers of rotary drilling equipment, is displaying its equipment in the exhibit of Houston Oil Field Material Company.

IT'S THE *TEAM* THAT SCORES!

VISIT US AT BOOTH 217
OIL-WORLD EXPOSITION — HOUSTON

Domestic Distributors:

AMERICAN SUPPLY CO.
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901 Century Building, Pittsburgh, Pennsylvania

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Export Distributor:

CONTINENTAL EMSCO COMPANY, INC.
30 Rockefeller Plaza, New York, N. Y.
Branches: Buenos Aires, London, Ploesti

One man may carry the ball across the goal line—but only teamwork makes it possible . . . Linemen smashing an opening in a solid wall of brawn . . . ends and backs blocking eager tacklers . . . Interference that sacrifices glory to let the runner score.

Each man must play his part precisely as schooled. None dare overplay it without weakening the team. The ball carrier may get the hurrahs —but **it's the team that scores!**

Likewise the worth of wire rope should never be judged by any of its individual characteristics. Strength is futile without flexibilty—without elasticity, toughness and durability. It takes "teamwork" of these five to produce long-lived wire rope.

In "Hercules" **(Red Strand)** Wire Rope the five essential characteristics of strength, flexibility, toughness, elasticity and durability all operate together in **balanced effort** to score the highest merits in economical, enduring service.

Specify "Hercules" **(Red Strand)** Wire Rope and be assured of the wire rope that is balanced to do a better job.

Made Only by

A. LESCHEN & SONS ROPE CO., 5909 Kennerly Ave., St. Louis, Mo.

ESTABLISHED 1857

NEW YORK CHICAGO DENVER SAN FRANCISCO SEATTLE PORTLAND

Benjamin Electric Manufacturing Company

▪ ***Floodlighting Equipment***

Benjamin Electric Manufacturing Company, Des Plaines, Illinois, has on display its latest equipment for floodlighting service station buildings and grounds, and in the lighting of various areas. Of special interest is the Benjamin Duo-Service Unit, equipped with the new Saxflow lowering device to make possible lowering of the floodlight to the ground for carrying on a weekly cleaning and maintenance schedule. Another unit is the Benjamin Column-Lite, designed for high level illumination of the pump islands and surrounding service areas.

M. J. Lewis Oil Well Service

▪ ***Directional Drilling Tools***

The Lewis Knuckle Joint, a tool for open hole deflecting of all kinds, and the associate tools used with the Knuckle Joint for directional work are being displayed by M. J. Lewis Oil Well Service, Houston, Texas. The knuckle joint is designed to enable the operator to change the course of a well, directing it toward any predetermined point

from either bottom hole or cement plug. Associate tools used in conjunction with the knuckle joint consist of: six-bladed knuckle joint reamer used in reaming hole to accommodate the tool itself; diamond point bit for drilling in formation; rotary shoe for deflection from cement plug; follow up bit used to continue hole started by the knuckle joint; pilot reaming bit to enlarge deflected hole to gauge; drag reamer used in smoothing walls of hole; and the wipe reamer used to build up drift angle.

▪ ***Drilling Bit***

In addition to the tools used in our directional work, the new Tarwin Bit, which is being introduced to the Mid-Continent and the Gulf Coast, is being displayed. This bit has been in use for several months on the West Coast, and is proving popular. In a recent Gulf Coast test the bit, which is of the revolving geared cutter type, demonstrated its ability to not only make a great deal of hole but to straighten it while doing so, the manufacturer claims. It promises wide usage in many type of formations.

Link-Belt Company

▪ ***Chains***

Link-Belt Company, Chicago, is displaying a complete line of rotary drilling chains, silent chains and roller chains. These various types are displayed on a panel, along with popular sizes of power transmission items used by the industry. Brilliantly illuminated pictures of various installations will form part of the background. An operating chain drive unit incorporating the various types of chains used on drilling rigs will be featured.

▪ ***Vibrating Screen***

A Link-Belt vibrating mud screen will be displayed in operation.

Edgar Tobin Aerial Surveys

▪ ***Aerial Maps***

To illustrate the aid which aerial photography has contributed in the process of finding and producing oil, Edgar Tobin Aerial Surveys, San Antonio, is displaying a comprehensive selection of the various types of maps it has produced during their ten years of specializing in adapting the medium of aerial photography to the complex mapping needs of the exploration and production branches of the oil industry.

During this period it has completed some 200,000 square miles of aerial photographic maps, some 125,000 square miles of geodetically controlled regional maps, and some 60,000 square miles of precise ownership maps. From this vast library, built up at the behest and in the service of the country's leading oil producing companies, this exposition exhibit aims to acquaint the oil world with the nature of aerial photographic mapping and the process whereby this and their ownership and regional mapping are constructed to the high degree of accuracy required by the exacting demands of oil exploration and production.

The Champion Rivet Company

▪ ***Rivets, Etc.***

The Champion Rivet Company, Cleveland, Ohio, is displaying two large glass cases showing the various upset products it manufactures. Among these items are rivets, car forgings, and chain pins. Also well displayed are various types of welding electrodes and welded test specimens. The company was established in 1895 and was the first to promote the use of steel rivets.

Nowery J. Smith Supply Company

▪ ***Tanks***

Nowery J. Smith Supply Company, Houston, Texas, is exhibiting a Columbian A.P.I. bolted steel tank of copper-nickel alloy, galvanized through and through, showing sectional view and recessed galvanized washers and nuts. Galvanized steel stairway and walkway, and galvanized flumes also are featured in its construction.

▪ ***Derrick***

The company's own steel derricks and substructures are on display. A derrick with regular legs and extended legs is shown.

▪ ***Separators***

Five types of oil and gas separators manufactured by the company are shown. Low pressure and high pressure types with automatic control equipment and standard level controls are featured.

M. M. Kinley Company

▪ ***Underground Fluroscope***

M. M. Kinley Company, Houston, Texas, is exhibiting a new instrument for determining where casing, tubing or drill pipe may be stuck, where cement has been forced outside of casing, or where casing may be leaking. This instrument is named the Under-Ground Fluroscope.

▪ ***Well Calipers***

Oil well calipers electrically operated for surveying the inside of oil, gas or water well holes also is being displayed.

Cutter Gun

A wire line cutter gun operated through explosives for cutting sand line or drilling line off is an interesting part of the exhibit.

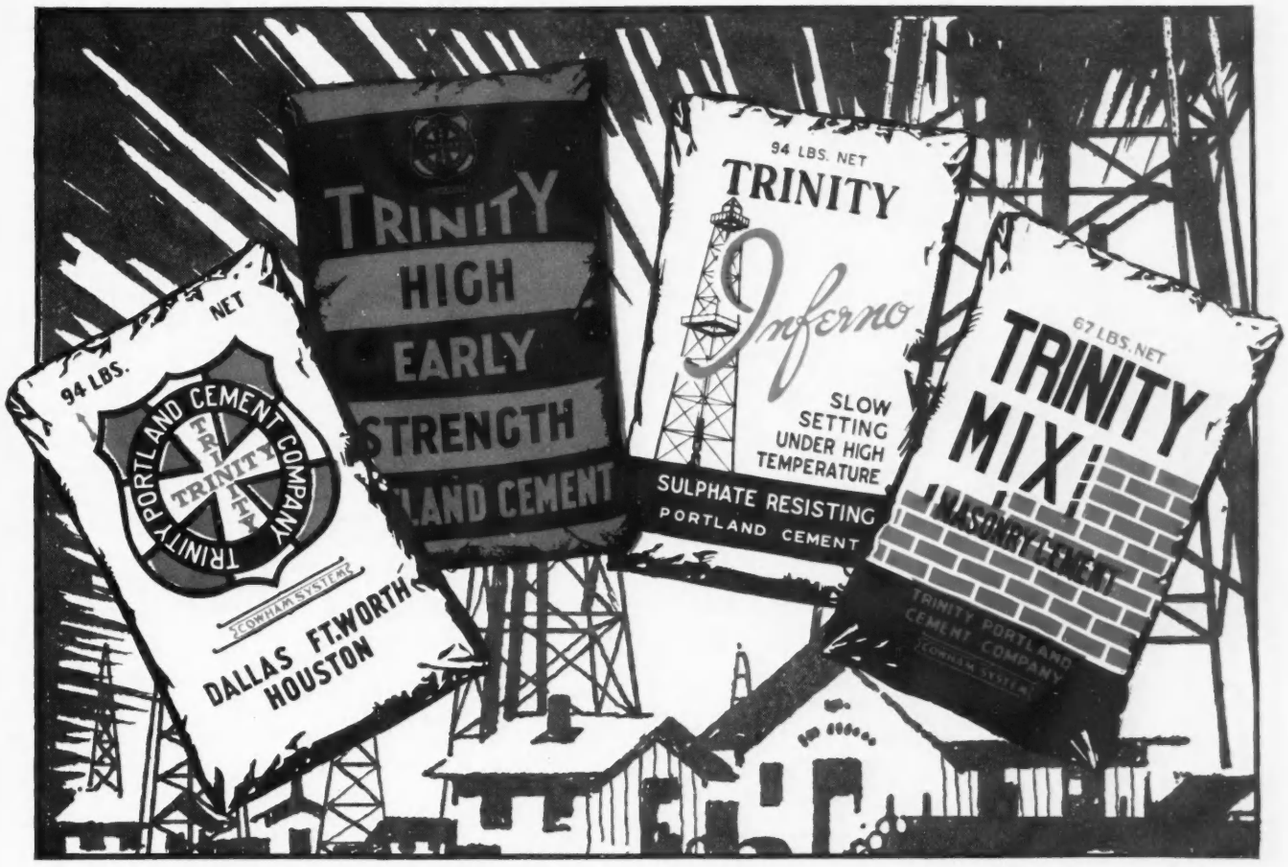
▪ ***Screen Explosive Device***

An appliance of explosives for removing external wrappings from screen pipe has attracted considerable interest wherever shown.

Frick Company

▪ ***Refrigerating Equipment***

Various refrigerating, ice-making and air conditioning equipment items are displayed by the Frick Company, Waynesboro, Pennsylvania. Features of the exhibit are an enclosed type ammonia compressor that is cut away to show the moving parts and turned over by a reduction gear motor. An ammonia booster compressor, designed for producing low temperatures, is kept in slow motion by a similar motor. A complete model of a dual pressure ice-making plant is a central part of the display. This model has been exhibited in foreign countries as well as in America and has attracted a great deal of attention. In addition, interesting photographs of installations are on display.



A TRINITY CEMENT FOR EVERY OIL FIELD NEED!

Whatever your cement needs, Trinity Portland Cement Company—with years of proven experience and integrity — can supply you!

Trinity Standard Portland Cement is truly the standard of quality for Portland Cement. It exceeds every specification and is used throughout the oil industry.

Trinity "High Early Strength" Portland Cement is a true Portland Cement, made of the same materials as Trinity Standard Portland Cement, with the same basic characteristic—the same ultimate strength—the same dependable uniformity—plus high early strength.

Trinity Mix Masonry Cement has widespread use and favorable acceptance as an outstanding masonry cement.

HOUSTON OCTOBER 11-16-1937
SEE OUR EXHIBIT
OIL WORLD EXPOSITION

Trinity "INFERNO" *Sulphate-Resisting Portland Cement* — a true Portland Cement made especially for deep oil-well cementing.

"INFERNO" has the same outstanding quality and uniformity as other Trinity products—plus the definite advantages that it is heat-resisting, sulphate-resisting, easy-handling, slow-setting, fast-hardening, under the tremendous pressures and high temperatures encountered in deep oil wells.

"INFERNO" is admirably suited for cement work at *any* depth where sulphate waters or high temperatures are found.

Three conveniently located plants assure prompt delivery. Consult with us about your cement problems.

TRINITY PORTLAND CEMENT COMPANY

DALLAS • FORT WORTH • HOUSTON

W. H. Curtin & Company

▪ ***Laboratory Equipment***

W. H. Curtin & Company, Houston, Texas, has on display in Booths 344-46 a number of interesting products for the laboratory. Included among the list is the company's No. 3610 International Model DE Explosion-Proof Centrifuge machine.

Curtin Model DE Centrifuge

The company also will exhibit products of the following manufacturers: Coors Porcelain Company, porcelain; Corning Glass Works, "Pyrex" glassware; Crosby Steam Gage and Valve Company, pressure gages and safety valves; The Hays Corporation, combustion control equipment; International Equipment Company, centrifuges; Kimble Glass Company, scientific glassware; Precision Scientific Company, laboratory equipment; Spencer Lens Company, microscopes; Strong, Carlisle & Hammond Company, steam traps; C. J. Tagliabue Mfg. Company, thermometers and pyrometers.

Petroleum Electric Power Club

▪ ***Electric Power***

Petroleum Electric Power Club, Houston, Texas, is exhibiting a display depicting the many applications of purchased electric power to the oil industry. Numerous electrical machines and equipment used in production, pipe line and refining branches of the industry are shown. The display shows several late applications of electricity to the handling of oil.

Goodall Semi-Metallic Hose & Manufacturing Company

▪ ***Metallic Hose***

Goodall Semi-Metallic Hose and Manufacturing Company, Philadelphia, with branches in Houston and Los Angeles, has an attractive display of various types of high-pressure armored Hose.

Emphasis in the exhibit is placed on "G.S.M." Rotary Hose in three separate and distinct types—Styles 500, 600 and 700.

The feature of the exhibit, however, is Style 600 "G.S.M." rotary Hose with enlarged ends, which hose gives full flow throughout the entire length.

"G.S.M." has on its exterior a continuous ball joint steel armor acting to resist external abrasion or abuse and carrying the greater portion of radial pressures of the hose. The armor protects the vital steel structural members within. "G.S.M." rotary hose is the only hose employing this principle of construction, which enables a balance of endwise radial pressures to be secured. An illustration of this fact is that "G.S.M." rotary hose under 7000 pounds per square inch pressure has an elongation of only one-quarter of one percent, the manufacturer claims.

Chain Belt Company

▪ ***Chains and Sprockets***

Chain Belt Company, Milwaukee, Wisconsin, has on display its line of rotary drilling chains and sprockets. The exhibit consists chiefly of a display of samples and pictures of the latest type products. Included among these chains are two brand new models now in production. Outstanding of these two chains is the Rex Champion chain, which is made with the same principles of alloy steel, highly finished bearing surfaces, and precision manufacture that are found in the Rex Deepwell chain, according to the manufacturer. It is made in the Champion No. 3 and No. 4. The latter is a heavier chain with a higher ultimate strength, and is recommended for the hardest service. The side bars on the No. 4 are accurately forged from alloy steel. The No. 3 has an ultimate strength of 75,000 pounds and the No. 4 an ultimate strength of 170,000 pounds.

Another new chain shown is the Rex Universal No. 3125, which is made in single or double strand for high speed drilling. It is built of alloy steels with offset side bars and ground pins and bushings. It is the new 3⅛-inch pitch chain for rotary drilling. This type chain is interchangeable with the A.P.I. No. 3 and No. 4 sizes. The single strand type has an ultimate strength of 115,000 pounds, and 230,000 pounds for the double type.

A full line of conventional A.P.I. rotary drilling chains is on display.

Chain Belt Rotary Drilling Chains

Goodall Rubber Company

▪ ***Rotary Hose Coupling***

Goodall Rubber Company of Houston's display is featuring the new Barney rotary hose coupling. This coupling has no stems, no clamps, and employs no metal in the bore of the hose. It was recently introduced to the trade after being tested on 9000 foot drilling under extremely high pressures. The Barney coupling is now an exclusive feature of Goodall Longlife Rotary Hose and, while it is built integrally with the hose, is interchangeable from one hose to another.

▪ ***Rotary Hose***

Longlife full-flow rotary hose also is a feature of the Goodall exhibit. A three-wire high-pressure rotary hose tested to 10,000 pounds.

▪ ***Inferno Steam Hose***

A steam hose built for service with heavy asbestos cord woven into its fabric. Capable of withstanding temperatures of 400 degrees and pressures up to 200 pounds.

▪ ***Goodall Newtype Cord Gasoline Hose***

Newtype Tank Truck Hose for all open nozzle service and Newtype Synplastic for all wet nozzle service. There is a Newtype hose for tank car, tank truck, curb pump, for the handling of crude oil, and in fact, for every service requiring a suction and discharge hose for petroleum and its products.

▪ ***Flexitallic Gaskets***

A complete line of these gaskets, for which the company is distributor, is shown.

Mueller Company

▪ ***Drilling Machines***

Drilling machines for drilling ¼-inch to 12-inch holes in all sizes of high-pressure pipe lines is being displayed by Mueller Company, Decatur, Illinois.

▪ ***Tapping Machines***

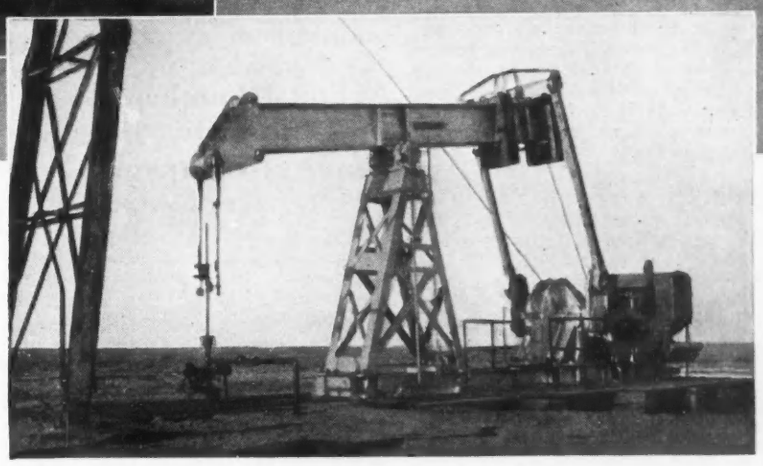
Tapping machines for tapping pipe lines under pressure and inserting stops and plugs ¾-inch to 2 inches, valve type steel welding fittings, plugging and stopping equipment for bypassing and all extension maintenance construction work on pipe lines without interruption of service or the supply, high pressure stops, siphon drip connections, and gas regulators.

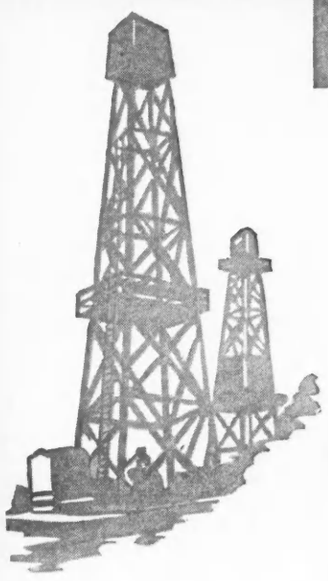
Standard Brake Lining Company

▪ ***Brake Lining***

Standard Brake Lining Company has a miniature loom weaving oil well brake lining. The exhibit is intended to show the intricate special weaving machinery used in manufacturing W-K-M brand and Standco brands of oil field brake lining.

LE ROI ENGINES





DEPENDABLE POWER FOR OIL FIELD SERVICE

Le Roi Valve-in-Head Engines are specially designed for the dependable operation required for oil field service. A complete range of sizes — for oil well pumping and drilling — is available.

Le Roi operating speeds are conservative, thus contributing to long life and low maintenance costs. Units can be equipped to burn natural gas, butane, or gasoline . . . Write for complete information.

Le Roi Company also builds engines for pipe line pumping stations and miscellaneous oil field service, sizes ranging from 4 to 400 H.P. — Engine driven generator units sizes ranging from 1½ to 200 K.W. — A.C. or D.C.

LE ROI COMPANY—MILWAUKEE, WISCONSIN

Branch Office and Warehouse . . . TULSA, OKLAHOMA

Hunt Tool Company

▪ *Wire Line Core Barrel*

Hunt Tool Company, of Houston, is featuring the Hunt wire line core barrel, and is showing both the hard and soft formation type core heads available with this barrel. The design of the Hunt wire line core barrel is such that the barrel seats in the cutter head rather than running entirely through the coring member. The barrel latches near the top of the drill collar under a sleeve and is quickly retrieved by an overshot run on the wire line. The barrel has nothing to do with the cutting, and consequently no driving device is necessary. Likewise, there is no necessity for an extremely thick walled barrel, since the function of the barrel is merely to receive the core. Greater inside diameter is therefore allowed, resulting in larger cores. The cutting member is an integral part of the core head, and the design of the Hunt wire line barrel core heads is such that unusual drilling speed is offered between the actual coring points.

▪ *Drilling Bits*

Hunt Tool Company also is displaying one of the largest lines of drill bits available to the oil country, more than 20 different designs of the most modern bits in the field, a type for most every class of hard, soft or medium formations.

Harnischfeger Corporation

Harnischfeger Corporation, Milwaukee, Wis., occupying booths 1222-24-26-28 and 1230, is displaying a dragline machine, electric hoists, and a welder.

▪ *Dragline*

On display is a P&H Model 150 dragline with ½ yard bucket that is equipped with a 30-foot boom and 18-inch crawler shoes. Salient features are: all-welded construction; tractor-type crawlers, etc.

▪ *P&H Electric Hoists*

The wide line of P&H electric hoists is represented by an operating display of a type "R-1" one-ton hoist with push button variable speed control, and Zip-Lift hoist of 500 pounds capacity with push button control.

▪ *Welder*

A working demonstration of welding is in operation constantly. P&H Hansen Smootharc welders and Smootharc welding arcs are being used. A 300-ampere

Model 150, ½-Yard Harnischfeger Dragline

Harnischfeger 300-Ampere Welder

Waukesha gas engine driven welder mounted on a four-wheel highway trailer is on exhibit, as well as a 300-ampere P&H Hansen Smootharc motor driven portable welder.

National Lumber & Creosoting Division, Koppers Company

▪ *Timber Ring Connections*

In the booth of the National Lumber and Creosoting Division of Koppers Company are ring connections as used in the construction of timber understructures for derricks. Actual samples are on display, showing how the rings are used where heavy timbers are bolted together.

The Joyce-Cridland Company

▪ *Jacks*

The Joyce-Cridland Company, Dayton, Ohio, is displaying at booths 719-721 a full line of jacks adapted for oil field service.

The exhibit includes the Joyce No. 2028 single-acting automatic-lowering jack, commonly designated the "Bearcat," because of its all-round adaptability for skidding rigs, moving boilers, etc. This is the original and pioneer 20-ton jack of this type.

Also on display is the very popular No. 78 emergency jack, which lifts, pushes or pulls from any angle.

Another feature of the exhibit is the Joyce "Liftmaster" line of hydraulic jacks which will be shown in a wide range of sizes and capacities. These are highly efficient light weight jacks for use with trucks and rolling stock, as well as general industrial service.

No. 2028 Joyce Jack

No. T-7-S Liftmaster Hydraulic Jack

Scintilla Magneto Co., Inc.

▪ *Ignition Devices*

Scintilla Magneto Co., Inc., Sidney, New York, in Booth 13, is exhibiting Bendix magnetos, Bendix spark plugs and other ignition devices. A feature of the display is a novelty in the form of a sectioned magneto in actual operation and supplying sparks to a series of spark gaps. The magneto itself operates without any mechanical drive or connection.

Zenith Carburetor Company, another subsidiary of Bendix Aviation Corporation, also occupies the same booth.

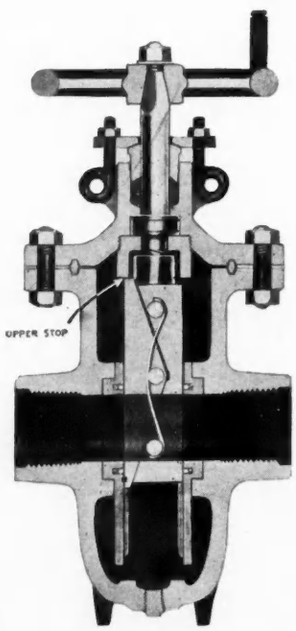
W-K-M Company

W-K-M Company has on exhibit inside the main auditorium the through conduit lubricated gate valve, rotary friction slips, tubing slips and spider, Cosco casing centralizer, mud screen, twin-seat slush pump valves, Everlasting blow-off valves, Hauser round kelly drive, portable pipe cleaning machines, sucker rod hangers, brake lining and the Pyramid water softener.

In an outside exhibit W-K-M is displaying in operation a Murphy Diesel engine and the Merco centrifugal mud separator and desander. In this outside exhibit also is demonstrating the W-K-M pipe straightener.

▪ *Gate Valves*

The W-K-M through conduit lubricated gate valve is designed to overcome the collection of sediment, scale, etc. The maximum area exposed to pressure in a W-K-M 3-inch valve is 59¼ square inches. The body serves as a grease chamber, in which all moving parts are entirely submerged in grease. Parallel gates expand uniformly and double wedge construction assures positive seal-off on both sides



W-K-M Lubricated Gate Valve

IT CAN'T HAPPEN HERE!

No chance for SEEPAGE . . . No possibility of a LEAK . . . No danger of a BLOW-OFF!

A "BOSS TRI-DUPLEX" MALE Rotary Hose Coupling in service . . . on the swivel end of hose connecting to the "kelly" . . . the point where punishment is most severe.

"BOSS TRI-DUPLEX"

ROTARY HOSE COUPLINGS

STYLE TD GIANT STYLE Z

At the critical point—where the greatest resistance to stresses, strains and constant vibration is required—*that's* where "BOSS TRI-DUPLEX" Rotary Hose Couplings prove their unfailing strength and stamina! *Guaranteed* to be leak-proof, seepage-proof, and blow-off proof under any pumping pressure, and to reduce hose replacement costs to an absolute minimum.

"BOSS TRI-DUPLEX" Couplings are precision-made from special alloy steel that provides exceptional strength and resistance to wear. All Stems are heat treated to give the correct hardness to withstand abrasion.

Staggered, projecting tongues on one clamp section engage staggered slots on the adjoining section of the clamp. The bolt lugs are also staggered longitudinally. These patented features provide a *perfect seal*, and distribute the clamping pressure *evenly* over the entire circumference of the hose.

"BOSS TRI-DUPLEX" STYLE TD and GIANT STYLE Z Rotary Hose Couplings are made Male and Female for 2″, 2½″ and 3″ I.D.—Male only 3½″ and 4″ I.D. Clamps accommodate outside diameters from 3½″ to 7″.

Your Jobber or Supply House can furnish "BOSS" Couplings and other dependable DIXON products promptly. Ask for Catalog or write direct for complete information.

Give the toughest jobs to the "BOSS"... then watch drilling costs go down!

DIXON VALVE & COUPLING CO.

MAIN OFFICE AND FACTORY

LOS ANGELES **PHILADELPHIA** **HOUSTON**

in either open or closed position. Patented bronze combination wipe-and-seal rings, in constant contact with the gate, keep gate and seats free from deposits, cleaning at each operation of the valve, it is claimed. Bronze seats, extra large, are quickly renewable.

▪ *Type 35 Friction Slips*

W-K-M Company is showing Type 35—rotary friction slips which take hold or

Rotary Friction Slips

release instantly, and will not slip, cut or bottleneck pipe, the exhibitors state. Light weight permits ease of handling. Highly flexible. Should wear occur on segments, they are replaced on the derrick floor, or resharpened. One-piece, drop-forged and heat-treated segments are used in the slips.

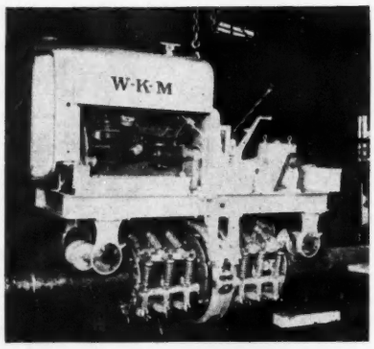
▪ *Hauser Round Kelly Drive*

Another item at the W-K-M booth is the Hauser round kelly drive, designed to enable the operator to drill in under pressure or in small diameter casing, using a joint of drill pipe or casing as a kelly. According to the manufacturers, this drive has flexible, self-adjusting roller racks to allow for misalignment and provide a positive drive for rotation. These drives are available for 2-inch, 2½, 3 and 4-inch tubing or drill pipe.

Hauser Kelly Drive

▪ *Pipe Cleaning Machine*

A pipe cleaning machine for use as a traveler or as a stationary contraption is shown at the W-K-M booth. Used as a traveler, it travels along the line under its own power at variable speeds, cleaning around two miles daily, according to the manufacturer. The machine has a double cleaning head containing many toothed cutter wheels which produce a chipping action, removing scale, rust and dirt. A series of steel wire brushes then brush the pipe. Scraper knives are used to remove felt or wrapping. The machine



Pipe Cleaning Machine

is built in sizes to accommodate pipe ranging from 2-inch to 24-inch.

Tubing Slips

▪ *Tubing Slips*

W-K-M tubing slips on display are built to fit tubing ranging in size from 1¼-inch to 4-inch, in regular type for medium depths and in deep well type for handling long strings. The construction is four and six segment, with forged steel being used throughout.

▪ *Pipe Straightener*

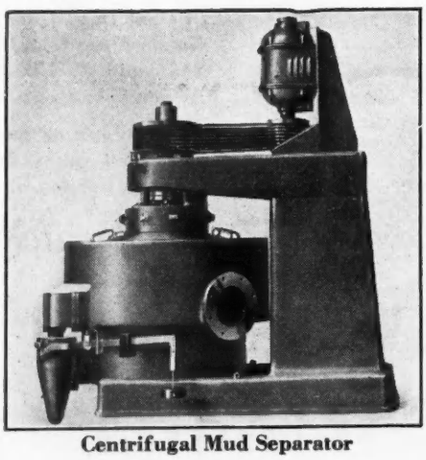
W-K-M also is displaying at its booth a portable pipe straightener, hydraulically operated. The straightener, which has a capacity of 40,000 pounds, according to W-K-M, will straighten or make any desired bend in pipe.

▪ *Rod Hanger*

W-K-M also is showing a rod hanger designed to save from 20 to 30 percent pulling time and protect rods against breaking, kinking, sand and grit.

▪ *Mud Separator*

The Merco centrifugal mud separator is shown at W-K-M Company's booth. According to the manufacturers, this separator has a settling force 67 times as great as gravity, and it mechanically removes



Centrifugal Mud Separator

substantially all sand and cuttings from drilling mud. It is designed also to perform the function of restoring weight to drilling mud and returning it to its original condition.

▪ *Mud Screen*

The W-K-M mud screen employs no steam turbines and no electric motors are required for operation. It does not depend on any motive power other than the natural flow of mud returns from the well. Screening is accomplished by rotation of the double screening drum, without excessively high speeds or vibration. Two separate screening surfaces are used, one to remove the coarse shale; the other to remove finer shale particles and the majority of the damaging sand.

▪ *Casing Centralizer*

The W-K-M "Cosco" casing centralizer holds casing in the center of hole and allows distribution of cement entirely around circumference. Preformed spiral spring steel blades have an undertwist throughout their curve, forming a cutting or scraping edge on their upper sides, and a sliding or smoothing edge on the under sides. When pulled upward, the springs scrape the lining of mud from the well, allowing the cement to bond directly with the formation. On the downward movement, springs trowel and smooth out the well bore. This preserves the well bore lining at any point. The spiral springs contact the entire circumference of the bore and do not cause irregular strictured surfaces, furrows, or keyseats plowed by vertical springs of the conventional type. As fluid passes the cleaner, the combined action of the spirals and the undertwist of the springs cause a whirling effect which eliminates channeling of cement and assists very materially in cleaning the well bore. This tool is pulled in and pulled out by means of lugs and slotted collars. Flexibility of blades allows it to pass obstructions or through tight hole.

Cosco Casing Centralizer

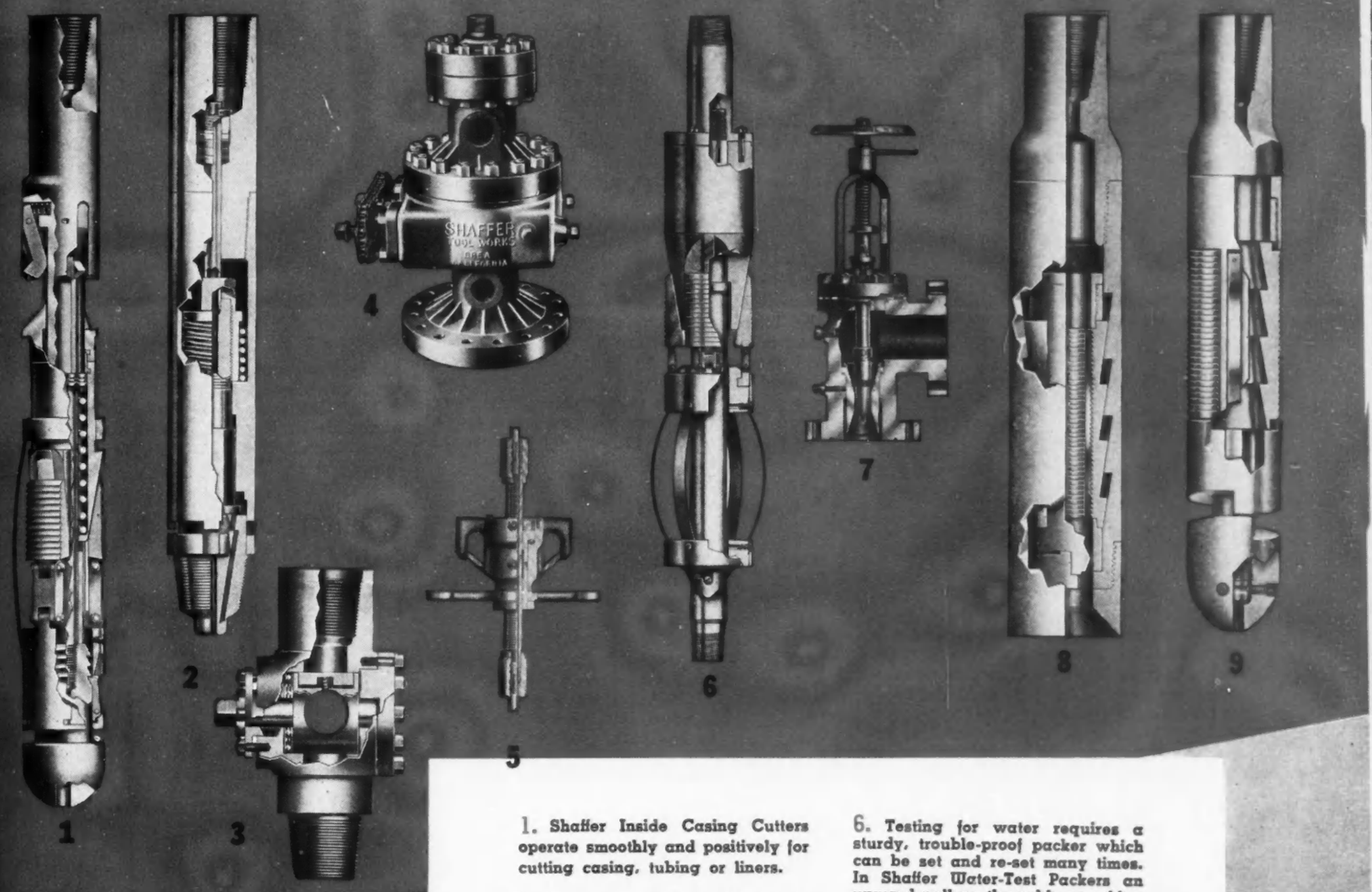
▪ *Water Softener*

The W-K-M Pyramid water softener passes the water through a chemical; all hardness is removed and water to the boilers is completely and thoroughly conditioned. The chemical contents of the softener are of practically permanent nature, as they may be regenerated at any time by flushing from the bottom with brine.

▪ *Murphy Diesel Engine*

Murphy Diesel engines are built in two sizes at present: 4-cylinder, 100 brake horsepower; and 6-cylinder, 150 brake horsepower, and are recommended for drilling rigs, generator sets, pipe line service, or for any type of service where

at the Houston Show



1. **Shaffer Inside Casing Cutters operate smoothly and positively for cutting casing, tubing or liners.**

2. **When a string of drill pipe is stuck in a tight hole, with the tool joint box or coupling up, your best bet for backing-off is a Shaffer Expanding Pin Tap.**

3. **A Shaffer Kelly Cock, placed above the Kelly, protects the rotary hose and insures control, if a well blows in through the drill pipe.**

4. **The Shaffer Universal Tubing Control Head is a simple, compact unit which prevents blow-outs while drilling in and tubing the well.**

5. **The pumper on his rounds can properly re-space rods when a Shaffer Rod Spacer is used, and it is not necessary to stop the pump.**

6. **Testing for water requires a sturdy, trouble-proof packer which can be set and re-set many times. In Shaffer Water-Test Packers an upward pull on the rubber packing element elongates the rubber, reduces its diameter, and permits easy release.**

7. **Shaffer Adjustable Flow Beans control the flow of fluid and make it possible to regulate both pressure and rate of flow with extreme accuracy. New hard metal inserts will be demonstrated at the Houston Show.**

8. **For safe, positive recovery of drill pipe, casing, or other tubular "fish" the Shaffer-Hamon Rotary Releasing Socket is popular in every active field.**

9. **Shaffer-Hamon Rotary Releasing Spears are "standard" for removing casing, for setting liners, for holding jobs, and for use with Rotary Jars.**

SHAFFER TOOL WORKS

BREA, CALIFORNIA

California Service Shops: Santa Fe Springs, Taft, Ventura
HOUSTON, TEXAS, 6006 Navigation Blvd.
OKLAHOMA CITY, OKLA., 1129 S.E. 29th Street
Gulf Coast Rental Stocks: Stone Oil Tool Co., 1207 Maury St., Houston, Tex.
Export Representatives: Oil Well Supply Company, New York, N. Y., U.S.A.

OU WILL
IND THE
SHAFFER
SECTION
on Pages 1548
to 1577 of Your
1937
COMPOSITE
CATALOG

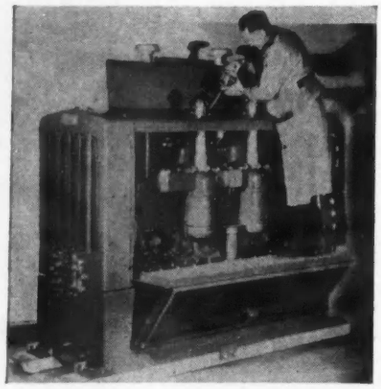
SHAFFER

Specialists in

FISHING TOOLS THAT EXCEL

light weight per horsepower is an important factor. The 4-cylinder 100-horsepower unit complete weighs 5800 pounds, and the 6-cylinder 150-horsepower unit complete weighs 7000 pounds.

As a safety feature the Murphys are equipped with a servo governor which operates on the lubricating oil, so that when the oil pressure drops to 30 pounds the



Murphy Diesel Engine

engine automatically shuts off. These engines also are equipped with a perfected fuel pump and injection nozzle unit for atomizing the fuel at any speed the engine may be running.

These power units come to the user complete in every detail, including steel skid mounting, ready for installation.

E. D. Bullard Company

E. D. Bullard Company, San Francisco, Calif., is exhibiting its safety first equipment, among which are the following:

▪ *Cylindrical First Aid Kit*

As its name implies, the Bullard Cylindrical First Aid Kit is cylindrical in shape and made of drawn aluminum. It is light in weight, dust-proof, water-proof and corrosion-proof. Its size and shape makes it adaptable to almost any convenient place, whether on a building wall, in the cab of a truck or mounted on a motorcycle. This kit makes it possible for industry to standardize on one type of kit for every use, thus minimizing stock of kits and refills necessary to maintain adequate first aid protection for all departments.

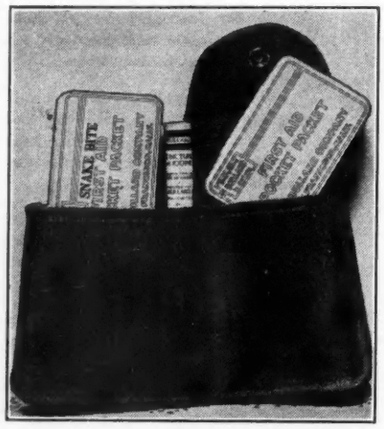
Cylindrical First Aid Kit

Contained in the cylindrical case is a removable canvas roll-up, which carries first aid dressings and treatments in clearly marked unit packets. The roll-up is removed by simply "flipping the clip" on the base of the aluminum container. It may then be carried to the spot where first aid treatment is to be given, and there draped over the forearm. Thus, the free use of both hands is permitted, and there is no reason to place the clean roll-up on the floor or on the ground where it would be open to contamination.

▪ *Combination Belt Kit*

This kit is designed for the man who wants complete first aid protection both for ordinary cuts and bruises and against bites of poisonous snakes and insects.

It includes a Venex Snake Bite Pocket Packet, a pocket size first aid kit and a Mult-Aply Antiseptic bottle. The Venex Kit and the First Aid Kit are metal boxes; the Mult-Aply Bottle is in a non-breakable package. All three units are contained in a compact, canvas case which may be stowed in a side pocket or attached to a belt.



Bullard Combination Belt Kit

The Bullard Combination Belt Kit weighs only ten ounces, completely filled, and measures 4 x 2 x 3 inches.

▪ *Weatherproof First-Aid Kits*

The unit packets contained in this kit are sealed against snow, rain and dust by rubber "weather strip" tubing. Metal to metal contact is thus eliminated and there is no chance for the cover to rust.

Made of pressed steel these weatherproof containers are finished both inside and out in a durable stipple green. Lower side walls make the unit packets easy to lift out. There is no more necessity for fumbling.

The inside cover of each kit contains an Instant Guide for First Aid, listing injuries, symptoms and approved treatments in a quick reference style.

Bullard Weatherproof First-Aid Kit

The Bullard Weatherproof Kits are available in 10 unit, 16 unit and 24 unit sizes, suitable for almost all working conditions.

Corbett Corporation

▪ *Oil Field Specialties*

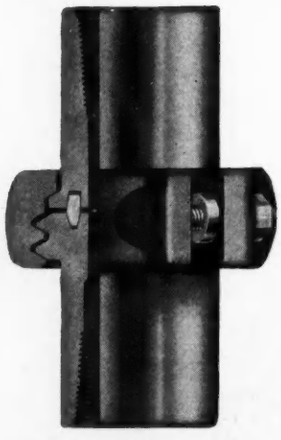
Corbett Corporation is displaying a large line of oil field specialties, among which are the following: Taylor Forge and Pipe Works forged fittings; Globe Seamless Steel and Tube Company boiler tubes and mechanical tubing; Champion rivets and welding rods.

Corbett Corporation is located in booths 934-936-938.

Red-Rex Corporation

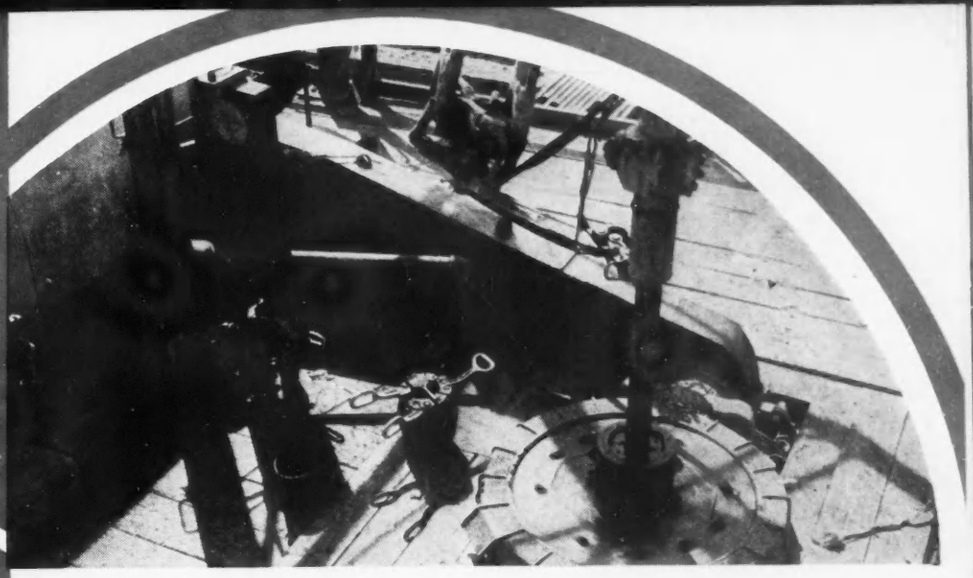
▪ *Pipe Unions*

Red-Rex Corporation, Houston, is displaying the Red-Rex pipe unions, which embodies a new principle. Features of the unions include their quickness and easiness to put on or take off. It is only necessary to turn the bolt. Automatically equalized pressure makes for safety against strains because of the use of taper principle. Taper on contact closes surfaces of hubs and clamps. The removable seal ring is made fast in recess of one hub. Open spaces control expansion and contraction. Extra long hubs afford ample space for chain tongs. These unions are tested for high pressure and are made in malleable styles for 4500 pounds and in steel for 8000 pounds.



Red-Rex Pipe Unions

T-I-W Slips



Showing the two halves of Two-piece Slips, also liners for same. 13¼" bearing surface against pipe.

Patented

USED IN SETTING THE LONGEST STRING OF 7⅝" CASING EVER SET

11,342 FEET, 422,000 POUNDS

Picture above shows

CONTINENTAL OIL COMPANY'S

Brookshire No. 1
Abbeville, South Louisiana

The three-piece T-I-W slips on the floor at the left are used in drilling the well; while two-piece T-I-W Slips were used in setting this world record string of 7⅝ inch casing.

LOFFLAND BROS. CO.

DRILLING CONTRACTORS

The hole is already one of the deepest ever drilled, and is still drilling to a possible world's record for depth.

★

Leading Oil Companies use T-I-W, the world's most complete line of slips because they do not crush or mar the pipe, and because they are dependable for wells of all depths.

TEXAS IRON WORKS

1401-1423 Maury Street **HOUSTON, TEXAS**

Eastman Oil Well Survey Company

▪ *Directional Instruments*

The Eastman Oil Well Survey Company exhibit at the Oil-World Exposition includes the Photographic Drift Indicator, an instrument designed to run inside of drill pipe and make a permanent record of the angle of the hole. By means of a simple photographing arrangement, a picture is made of the position of the plumb bob cross hairs upon a concentric system of circles calibrated to one degree intervals. The accompanying illustration is an actual size reproduction of a record obtained with this instrument, showing the hole to be 6½ degrees off vertical. After the instrument is run in the hole and the picture has been taken, which is indicated by the synchronized surface watch, the instrument is brought to the surface and the record is developed on the derrick floor. The resulting record is easily read by counting the number of rings outward from the center to

Eastman Photographic Drift Indicator Record.

the intersecting cross hairs, each circle representing one degree of angle.

Other Eastman instruments exhibited at the exposition include: the Single-Shot Surveying instrument, which is run in an uncased drill hole to make a permanent photographic record of the angle and direction that the hole is off vertical at the point of survey; the Inside Single-Shot Survey instrument, which, as its name implies, is run inside of drill pipe to make a photographic record of the angle and direction that the hole is off vertical at the point of survey; the Multiple Shot instrument, which is run in either uncased or cased hole to record photographically the angle and direction that the hole is off vertical, making a record every two minutes while it is being lowered in the hole; the Eastman Auto-Photo Orientor for use in orienting pipe in conjunction with the Multiple Shot Survey; the Drift Indicator, which is run inside of drill pipe to make a photographic record of the hole's straightness; and the Eastman Removable Whipstock and Orienting equipment.

Crutcher-Rolfs-Cummings

Crutcher-Rolfs-Cummings is displaying W-K-M Model F pipe cleaning machines, Wilson electric machines, K & M leak clamps, and Coffing hoists.

▪ *Pipe Cleaning Machine*

The Model F cleaning machines are small, light weight, power driven machines, designed for cleaning and priming, or both, for pipe sizes 2 inches to 24 inches, inclusive. Power is furnished by single-cylinder Briggs-Stratton motor, which revolves cleaning head around pipe at 110 revolutions per minute. Machine travels along pipe at speeds ranging from 2 to 50 feet per minute, depending on condition of pipe and degree of cleanliness desired. Thorough cleaning of pipe is accomplished by series of toothed cutter wheels rotating around pipe, producing a chipping action. A brush head equipped with four steel wire brushes can be furnished for brushing pipe before priming. Both cutter and brush heads are made in separate units so that the desired type head can be quickly attached to the chassis. A priming head with tank for holding primer can be furnished and is attached to the drive chassis.

By the use of these different units, the machine is adapted for cleaning, brushing and priming of new pipe, and is also desirable for reconditioning work.

▪ *Wilson Electric Welding Machines*

These machines are built on a light weight reinforced base and framework, gasoline engine driven, close coupled. Center of gravity lowered one foot. Improved fool-proof idling device. Double sediment collectors for carburetor supply. Air strainer. All controlled on one side of machine. Improved current switch. Center lifting bail. Radiator protecting grill. Distributor and other parts accessible. This can be furnished with either battery or magneto ignition. Specially built to meet the needs and conditions of pipe line work.

▪ *K & M Leak Clamps*

This clamp is simple, positive, quickly installed, for the sealing of large or small leaks in oil, water, and gas lines. It is made in two sizes, the small yoke size to fit 4-inch and 8-inch pipe. The large yoke size to fit all pipe sizes from 10-inch up to 24-inch in diameter. These clamps consist of a cast yoke, steel cam, and adjustable steel plunger, a cast seat, two steel clevis links, and pins with malleable chain of 3100 pounds test, or steel chain of 4800 pounds test, and a Duprene rubber cone. For welding saddles or patches on pipe lines, we can furnish cast steel shoe which will fit the contour of the pipe and which replaces rubber cones under the seat.

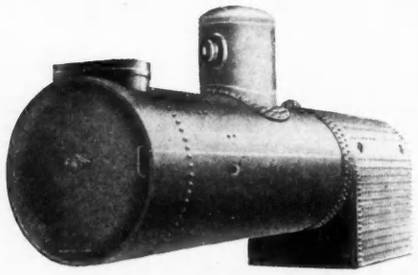
▪ *CRC Pipe Line Special Hoist*

The Coffing hoist is a ratchet type with certified malleable iron frame casting sprocket, and ratchet shaft made of solid piece of high carbon tool steel, drop forged, heat treated and ground, furnished with special heat treated Diamond chain developed to meet the terrific strain received by overloading. Safety valve handle made of certified malleable iron that will bend under maximum overload before any other parts will give. Equipped with special steel drop-forged hooks, heat treated. Made specially to meet needs and requirements of pipe line work.

Farrar & Trefts, Inc.

▪ *Boilers*

Farrar & Trefts, Inc., of Buffalo, N. Y., is exhibiting a 125-horsepower 350-pound working pressure drilling steam boiler with fusion welded barrel, dome and firebox joints. This is a new method of boiler construction whereby more than 500 rivets are eliminated, besides many overlapping plates and straps.



Farrar & Trefts Boiler

The saving in weight alone amounts to almost 10 percent, it is said. The manufacturers claim many other advantages for this design, such as: easier handling, better and quicker cleaning, etc.

Johns-Manville

▪ *Insulations, Linings, Packings, Etc.*

A wide variety of products, which serve the oil industry in a number of ways, are featured at the Johns-Manville exhibit.

Included in the display are insulations and refractories, brake linings, packings and materials for the protection of underground pipe lines.

Other J-M products to be shown are Celite Filter-Aids, used in the clarification of lubricating oils; Transite Asbestos-Cement Pipe for salt water disposal; and Corrugated and Flat Transite Asbestos Sheets for industrial roofing and siding, and for furnace casings.

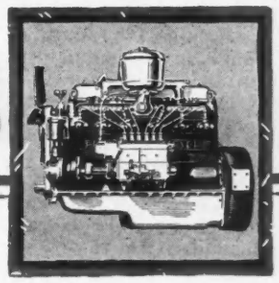
Transite Asbestos-Cement Pipe

PROVED BY YEARS OF SERVICE IN THE OIL FIELDS OF THE WORLD

Hercules Engines have long held the respect of operators in oil fields all over the world. Oil men know that in continuous, 24-hour service—handling maximum loads with necessary efficiency and economy — Hercules power is always dependable. For rotary drilling, spudding, well servicing, pumping—and other heavy-duty uses—Hercules powered equipment has for years stood the severest tests the oil fields can offer. Hercules Engines and power units—both gasoline and Diesel—are distinguished for advanced engineering, simplicity of design and sturdy construction.

HERCULES MOTORS CORPORATION, CANTON, OHIO

America's Foremost Engine Manufacturer • Power Plants from 4 to 200 H. P.

HERCULES  **ENGINES**

Gaso Pump & Burner Manufacturing Company

▪ ***Pipe Line Pumps***

Gaso Pump & Burner Manufacturing Company of Tulsa, manufacturers of pipe line pumps of various sizes and types, are located in 512 and 514.

Durametallic Corporation

▪ ***Packing***

Durametallic Corporation, Kalamazoo, Michigan, is displaying in Booth 409 its full line of packing. Included is the Grade D-10 in spiral form and Grade D-110 in die molded ring sets. This packing has long been an important item of maintenance in refineries working hot oil both on centrifugal and reciprocating pumps. In addition the company's Grade C-10, C-110, B-10 and B-110, for steam, water and cold oils are displayed.

▪ ***Mechanical Seal***

The company's mechanical seal, known as "Dura Seal", is being displayed on a pump in operation. This type of seal has been used extensively on centrifugal pumps handling propane, butane and other light ends of petroleum.

▪ ***Packing Puller***

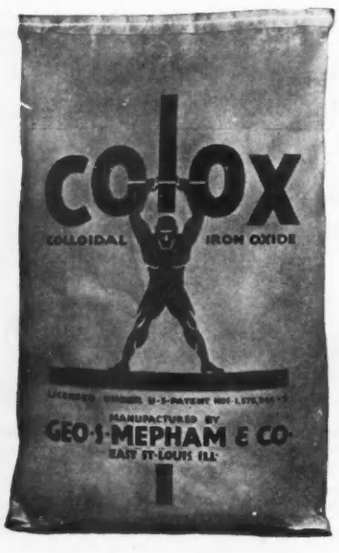
A flexible packing puller, known as "Dura Hook", is being shown in all sizes.

George S. Mepham Corporation

▪ ***Drilling Mud Materials***

Colox Sales and Service, a division of George S. Mepham Corporation, has on display at Oil-World Exposition the complete line of drilling muds and chemicals, including Colox, Jelox, Suspendo, Chemical "Z", and Meptol.

Featured in the Colox exhibit is the new Jelox, which mixes readily. The new Jelox offers complete dispersion quickly without forming agglomerates or clots, and does away with the job of "cooking."



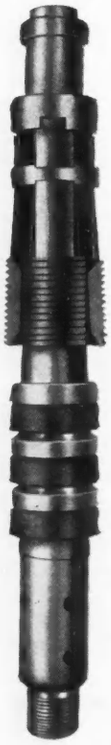
Suspendo is a clay product offered by Colox for use in wells where a weighting material is not necessary, but where a suspension material and a wall builder are desired.

Chemical "Z", a special chemical for the control of jell in drilling muds, comes to the field in liquid form in convenient 5-gallon containers.

Meptol is the powdered form of chemical sold by Colox Engineering Staff for mixing with water on the job before applying to the drilling mud stream.

Otis Pressure Control, Inc.

▪ ***Control Equipment***



Otis Removable Bottom-Hole Choke

The exhibit of Otis Pressure Control, Inc., Dallas, Texas, is a display of the complete line of Otis equipment for the proper control of wells during the drilling, completion and production stages.

The following Otis equipment make up the display.

Square Kelly drilling head and pressure-control drilling equipment;

Snubbing and control equipment and service for running and pulling tubing, packers, drill pipe or casing under pressure;

Tubing closing tool;

Removable bottom-hole choke;

Mixing Valve;

Removable tubing, casing and drill pipe plugs;

Chucker type paraffin scraper and removable paraffin scraper stop;

Removable drill pipe float valve;

Removable differential operated tubing valve;

Tubing heads and stuffing boxes for landing tubing under pressure;

Service for taking bottom-hole pressure.

Texas Electric Steel Casting Company

▪ ***Castings***

Texas Electric Steel Casting Company, manufacturers of Tesco electric steel castings, is devoting the Tesco booth at Oil-World Exposition to a telephone and telegraph service for the convenience of oil men and manufacturers attending the show.

Through an arrangement with Southwestern Bell Telephone Company and Postal Telegraph Company, the Tesco booth provides visitors of the opportunity of receiving telephone calls and wires from all parts of the country right on the Exposition floor, including a special Tesco page service. Complete telephone and telegraph facilities have been installed to provide outgoing as well as incoming messages.

Wheeler Reflector Company

▪ ***Lighting Devices***

Wheeler Reflector Company, Boston, Mass., is featuring lighting equipment designed for use in hazardous locations. Included in its display are the following types of equipment:

Wheeler Reflector

Explosion-proof fixtures approved for use in atmospheres containing gasoline, petroleum, naphtha, alcohols, acetone, lacquer solvent vapors and natural gas.

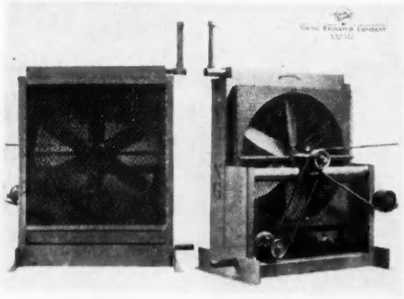
Dustight and vapor-proof fixtures approved for use in establishments and industries where combustible dust atmospheres exist.

Other types of equipment on display include gas pump island lights, open and enclosed floodlights and various types of sign lighting equipment.

Young Radiator Company

▪ ***Water Cooling Units***

Young Radiator Company, Racine, Wisconsin, is exhibiting at Booths 1304-1306 its various products, featuring the Young jacket water cooling system. The company is further showing a self-contained portable unit including cooling coil, fan, water pump, drive, and all necessary equipment for cooling gasoline or Diesel engines ranging in size from 25 to 125 horsepower.



Young Water Cooling Unit

Other products on exhibit will be heavy-duty radiators, which are used by manufacturers of power equipment, oil coolers, heat exchangers, and various types of heating and cooling surfaces. The type of construction is exemplified in each case by a detailed section of the core.

PURCHASED *Electric* POWER

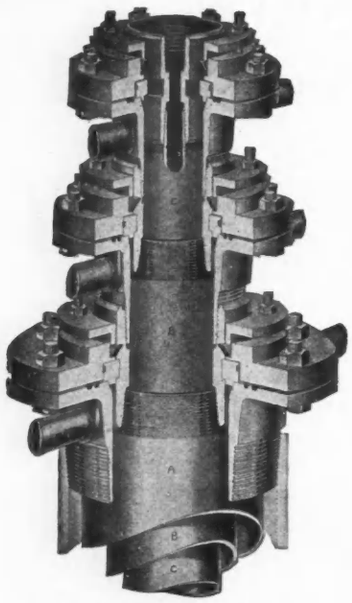
WE OF THE ELECTRIC POWER INDUSTRY
WELCOME YOU OF THE PETROLEUM INDUSTRY
TO THE OIL-WORLD EXPOSITION

HOUSTON LIGHTING & POWER COMPANY

Rector Well Equipment Company

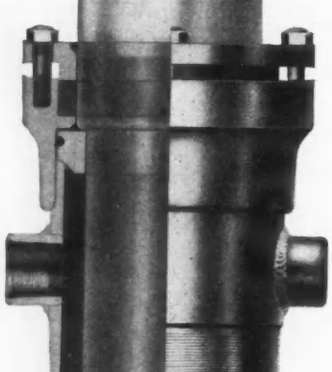
▪ ***Heads and Flanges***

Rector Well Equipment Company, Fort Worth, Texas, is displaying the complete line of Rectorheads, the Rector tubing head, Rector Drilling flanges, the special Rector casing flange and the Rector cable tool drilling head.



Stack of High Pressure Rectorheads

Included in the line of Rectorheads to be exhibited at an oil exposition for the first time is the Type "EH", a 10,000-pound test head; the Type "AH", of 6000-pound test, with the API Series 900-Flange bolting and packing arrangement; the Type "AM", 4000-pound test, with the same flange and packing arrangement; and the new Rectorhead arranged for welding. All Rectorheads now may be fitted with special split rings and special slip fit collar to enable the user to weld the top end of the oil string. After stretch is taken in the pipe, the split rings are welded directly to the pipe and lowered to seat. Casing is then cut off a short distance above the ring, and the slip fit collar applied and welded inside and out. These parts are interchangeable with regular split ring and recessed coupling and the top flange is applied in exactly the same manner as the regular Rectorhead.



Low Pressure Rectorhead

Displayed also for the first time is the Type "C" Rectorhead, a cast semi-steel 1000-pound test head for low-pressure wells.

Transportation Equipment Company

▪ ***Transportation Equipment***

Marmon-Herrington All-Wheel-Drive trucks, Timken Two-Speed axles and trailer axles, Bendix power brokes, Galion Allsteel dump bodies, truck flares and miscellaneous truck equipment are featured by Transportation Equipment Company, Houston, in its elaborate display in Booth 1013. United States Electrical tools, Joyce hydraulic and mechanical jacks, Steelcote penetrating metallic paints, Deluxe oil filters and other specialties also are shown.

▪ ***Tanks***

Columbian Steel Tank Company's products are displayed at Booth 1013.

M. O. Johnson Oil Field Service Corporation

▪ ***Formation Testers***

M. O. Johnston Oil Field Service Corporation is exhibiting its complete line of formation testing tools at the Oil Show in Houston. A novel feature of the exhibit is a glass oil well in which operates a 6-foot model of the Johnston testing tool. The model incorporates all the outstanding features of the Johnston tester, and shows how each valve functions without twisting or turning the drill string. It shows the operation of the patented trip valve, which differentiates between drill pipe leaks and actual formation tests; the patented retainer valve that functions automatically with the lifting of the drill pipe; and the automatic equalizing valve that balances the pressure above and below the packer before it is lifted from the seat, thus freeing the drill string of excessive lifting strains. Colored liquids are used in the model to show the direction of travel of the formation fluid into the drill string, and the method of preventing mud from entering the test section.

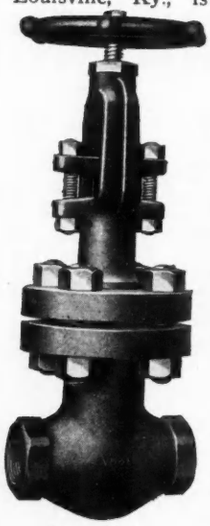
The Johnston exhibit is housed in Booths 1317 and 1319 in the main entrance to the building.

Johnston Tester

Henry Vogt Machine Company

▪ ***Valves and Fittings***

Henry Vogt Machine Company, Louisville, Ky., is displaying a complete line of drop-forged steel valves, fittings and flanges at the Oil-World Exposition. In addition to flanged and screwed end valves of many sizes and types, there is shown screw end ells, tees, cross and flanges and Socket Weld Ells and tees recently announced by the company.



Vogt Valve

In the complete Vogt drop-forged steel line there are valves, fittings and flanges especially suited for the producing and pipe line divisions. These products may be procured in carbon or stainless steel as desired, and for high pressure and high temperature service.

The Foxboro Company

▪ ***Recording Instruments***

The Foxboro Company, Foxboro, Massachusetts, is exhibiting a complete line of indicating, recording and controlling instruments for the oil industry in Booth 105. Featured are such interesting new developments as the Foxboro Pneumatic and Electric Remote Transmission Systems. With this system it is possible to send readings of flow and level pneumatically as far as 500 feet from the point of measurement. The electric distance transmission system employs self-synchronizing electric motors housed in explosion-proof units to transmit readings of flow and level electrically up to 2000 feet from the point of measurement. Both of these new systems permit the use of air-operated control instruments. This year the instruments exhibited by the company are grouped on a central panel board to provide an easier examination. All instruments on display will be actual operating models and are fixed so that they can be easily demonstrated.

Kinzback Tool Company, Inc.

▪ ***Drilling Tools***

Kinzback Tool Company, Inc., Houston, is featuring three types of Kinzback sectional whipstocks, a complete line of milling tools, the Kinzback Pony Rod eliminator, the Bowen pressure wire line hook-up, the Bowen line wiper, Bowen overshots and Kinzback line of casing shoes, rotary shoes, taper taps and die nipples.

Houston Oil Field Material Company

▪ *Drilling and Producing Equipment*

Houston Oil Field Material Company, in cooperation with 14 manufacturers, is displaying the line of Homco drilling and production equipment in a 12000 square foot exhibit in the main auditorium and an 800 square foot outside exhibit.

The display includes The Wheland Company rigs, Lucey Boiler and Manufacturing Company boilers, Standard Brake Lining Company brake lining, Crane Company valves and fittings, Hazard Wire Rope Company wire rope, Hinderliter Tool Company casing heads and tool joints, Technical Oil Tool Corporation well surveying, Kane Boiler Works welded pipe, Babcock & Wilcox Tube Company boiler tubes, Mid-Continent Mud Company drilling muds, Hinsdale Tool Company non-sparking tools, and Emsco Screen Pipe Company screen.

The Homco outside exhibit shows in operation a new pumping unit especially built for Homco by Texas Steel Company and powered by a Weber engine.

This display also features a complete line of Homco fishing and cutting tools.

Merco Centrifugal Company

▪ *Mud Desander*

Merco Centrifugal Company, San Francisco, Calif., exhibiting in the series of booths showing products handled by W-K-M Company, Inc., Houston, is showing a type A20 centrifugal rotary drilling mud desander. It is in operation on typical rotary drilling mud, demonstrating the separation of sand and cuttings from the fluid. An interesting feature of the display is that sand will be extracted from the mud at very much higher density than heretofore accomplished in a centrifugal separator. In addition, this new machine is said to operate at about 75 percent of the speed of previous models.

The Guiberson Corporation

The Guiberson Corporation, Dallas, has on exhibit in Booths 458, 460, 561, 139 and 141 of the main exposition building, a complete line of its oil well specialities.

▪ *Drilling-In Pressure Control Equipment*

The first five spaces of the Guiberson exhibit is devoted to its equipment used in drilling under controlled pressure, which is as follows: Type "A" Friction Kelly Drive set up on a "D" Oil Saver as it is used on wells. Type "B" Collapsible Friction Kelly Drive set up with the "C" Drilling Head, the Detachable Coupling, and the "D" Oil Saver. The small Collapsible Friction Kelly Drive is shown set up with the "B1" Oil Saver; showing this equipment as it is used in clean-out work. The "C2", the "D", and "B1" Oil Savers also are in this section lying on the floor, so that the inside can readily be seen as to the type of rubber construction in these oil savers, etc. The Float Valve and the Casing Tong also are exhibited in this same section.

▪ *Production Tools*

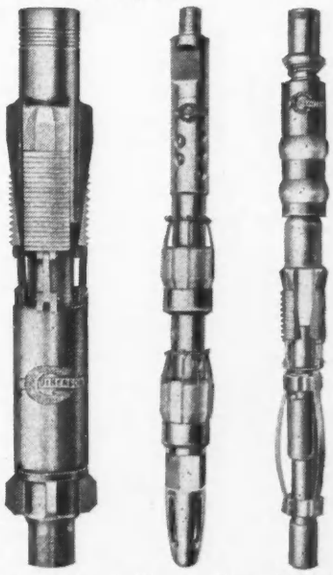
Another section is devoted to production tools, which include the Type "E" Tubing Catcher shown with and without anchor, and the "B" Tubing Catcher with and without anchor. There is a hydraulically operated rack where tubing catchers

Guiberson Tubing Spider

can be operated to show them working. In this booth also are three weights of floor blocks and two spiders, the medium and heavy types. Here also is exhibited the Sucker Rod Stripper, the "C" Tubing Stripper, the Tubing Tong, and the Casing Tong.

▪ *Swabs and Packers*

In another booth is shown Guiberson packers. The control head packers are the following types: "C1," "C," "G1," "GT," "GL," "GA," "F," and "R." Here also are the Spiral Tubing Packer, the Spiral Casing Packer, the Bottom Hole Plug, the Collapsible Core Plug, and the Wash Down Plug. Also in this section is shown the firm's complete line of swabs; the Type "K" Tubing and Casing Swabs, the Type "A" Tubing and Casing Swabs, the Type "H" Tubing Swab, and Type "F" Tubing and Casing Swabs. Rope Sockets also are in this group.

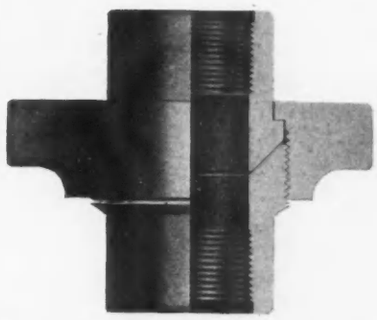


Left to right: Guiberson Type E Tubing Catcher; Type G-1 Control Head Packer; and Type K Swab.

Well Equipment Company

▪ *Wing Union*

Well Equipment Company, Inc., Houston, Texas, is featuring its "Weco" wing union, which is easy to assemble and dismantle without the use of wrenches and designed for drilling wells, pipe lines, water lines, steam lines, refinery, power plants and compressor stations. A ball peen hammer is all that is required in making up and breaking out connections where this union is used. It is manufac-



Weco Wing Union

tured in sizes from 1 inch to 4 inches in 500-pound steam working pressure; and 2 inches and 10 inches in 3000-pound and 5000-pound test. The 6-inch, 8-inch and 10-inch sizes are used on pump suctions, in which cases the union is furnished complete with a special bull plug for compounding when required.

▪ *Hamer Lubricated Valves*

Also a feature of the Weco booth is the complete line of Hamer lubricated plug valves which are opened and closed by the simple use of a bar; which employ an elevator plug wing nut to prevent

Hamer Valve

sticking; which are lubricated by stick grease and Alemite gun; and which have many other advantageous features well known to the field.

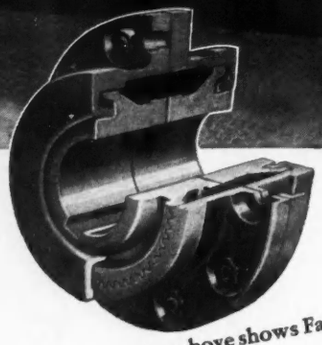
▪ *Other Equipment*

Other equipment displayed in the Weco booth includes the Weco safety boiler gauge cock, the Weco speed valve panel, the Thompson steam gauge protector, Thompson fusible plugs, Real-Fire burners, the Okadee line of blowoff valves, and the Gulf Lubricator line of steam lubricators.

KOPPERS

FAST'S SELF-ALIGNING COUPLINGS

PROVEN PERFORMANCE IN DRILLING... PUMPING... REFINING



The illustration above shows Fast's construction.

Fast's Couplings serve more than the national field. Here they are used on pumps handling fuel oil for the Chile Exploration Co., Tocopilla, Chile.

Koppers Divisions, Subsidiaries and Affiliates Serving the Oil and Gas Field

AMERICAN HAMMERED PISTON RING DIVISION . . . . BALTIMORE, MD.

BARTLETT HAYWARD DIVISION . . . . BALTIMORE, MD.

ENGINEERING AND CONSTRUCTION DIVISION . . . . PITTSBURGH, PA.

WESTERN GAS DIVISION . . . . FORT WAYNE, IND.

TAR AND CHEMICAL DIVISION . . . . PITTSBURGH, PA.

THE WHITE TAR COMPANY OF NEW JERSEY, INC. . . KEARNY, N. J.

THE WOOD PRESERVING CORPORATION . . . . PITTSBURGH, PA.

NATIONAL LUMBER & CREOSOTING COMPANY . . TEXARKANA, ARK.-TEX.

Koppers Principal Products for the Oil and Gas Field

American Hammered Piston Rings ...Fast's Self-aligning Couplings... Phenolate Hydrogen Sulfide Recovery Systems...Tanks...Platework... Special Machinery...Valves...Roofing...Waterproofing.. Treated Piling, Posts, Lumber, Poles ... Creosote Oil ... Benzol ...90% Benzol ...Tar Acids...Cresylic Acid ...Iron Castings ... D-H-S Bronze Castings ...Time Cycle Controls ... WESTERN Fire Hydrants ... Gas Scrubbers ... Pipe ... Welding

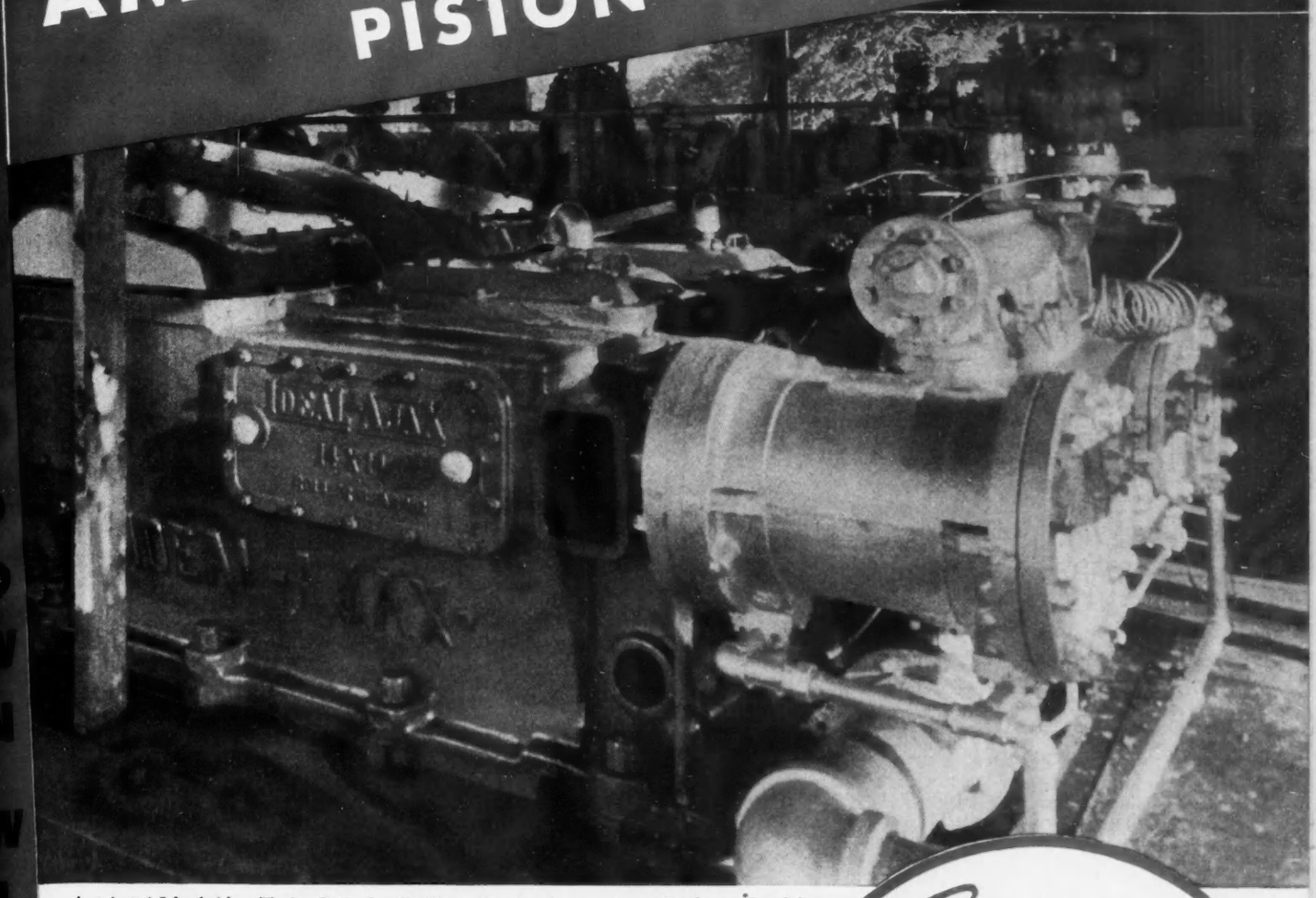
Where shut-downs for repairs may cost thousands of dollars an hour, dependability in equipment becomes vital. And so engineers who know Fast's record for unfailing performance, specify it on drilling rigs, pump drives, and other field and refinery equipment.

There's a real reason for Fast's reputation. The load-carrying surfaces are protected against wear by a positive film of oil. Rocking bearings—indispensable features of design, exclusive with Fast's—make a permanent dust-and-moisture-proof, metal-to-metal seal. No perishable materials, springs or grids are required. For couplings that can "take it," no matter how tough the going, *follow the leaders*—and specify "Fast's".

KOPPERS COMPANY
BARTLETT HAYWARD DIVISION
BALTIMORE · MARYLAND

KOPPERS

AMERICAN HAMMERED PISTON RINGS



A 14x14 Ideal Ajax Twin Cylinder Drilling Engine in service at Rodessa, Louisiana.

Two miles . . . not such a great distance, as distances go. You can walk it in 25 minutes, ride it in two, fly it in thirty seconds. But two miles *straight down*—that's something else again . . . but just as easy for Ajax.

Ajax drilling engines have drilled some of the deepest holes in the world, including the 12,000 foot Elender No. 1 in Southern Louisiana. They have been noted for advanced design and performance since 1877. With such a reputation to maintain, it is a real tribute that Ajax equips its engines with American Hammered Piston Rings.

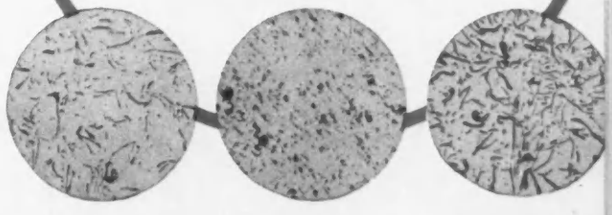
In every oil field on earth, you'll find Ajax Engines and American Hammered Piston Rings working together.

KOPPERS COMPANY
AMERICAN HAMMERED PISTON RING DIVISION
BALTIMORE · MARYLAND

Specialization

STARTS with the METAL

For best service, various piston ring applications demand various properties in the rings. All necessary properties cannot be incorporated in manufacture . . . some must be inherent in the metal. American Hammered Piston Rings are therefore produced in more than 15 different alloys. For example:



For high speed service . . . an alloy like this | **For steam . . . an alloy like this** | **For compressor service . . . an alloy like this**

KOPPERS

DESIGNERS . . . BUILDERS . . . PRODUCERS . . . MANUFACTURERS . . . OPERATORS . . . DISTRIBUTORS

THE SUN NEVER SETS ON AN AJAX

Ensign Carburetor Company

▪ ***Carbureting Equipment, Etc.***

Ensign Carburetor Company, Ltd., Los Angeles, is displaying a full line of precision carbureting and fuel regulating equipment. The display is at booth 757 and contains all the various models and sizes of gas, gasoline, and combination carburetors; heat exchangers; fuel regulators; and butane equipment manufactured by the company. A portion of the exhibit includes cut-out models of various types of Ensign products, and shows exactly how this equipment functions in actual service.

The display reflects the company's policy of continual pioneering and development work which has been responsible for notable and valuable contributions toward the advancement of power equipment during the past quarter of a century, it is stated. Many engines, factory equipped with Ensign carburetors and fuel regulating devices, are in successful service in oil fields throughout the country.

Abercrombie Pump Company

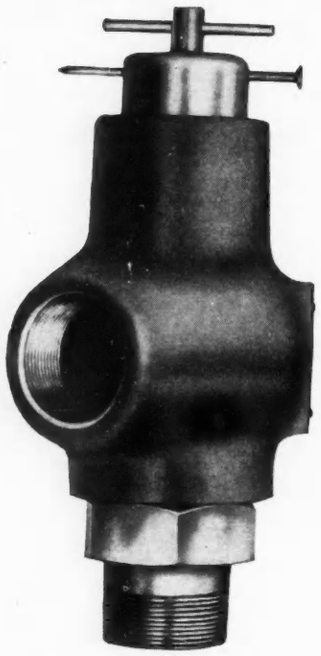
▪ ***Slush Pumps***

Abercrombie Pump Company of Houston, Texas, is displaying one of its 20-inch stroke Fluid-Piston slush pumps, direct connected to a 16¼-inch by 20-inch steam end. This type of equipment is designed for discharge pressures up to 3000 pounds per square inch and is applicable to heavy duty, deep drilling. The fluid end incorporates the all-steel sectional construction characteristic of all Fluid-Piston slush pumps. Valve seats are of the type developed for slush pump service by Abercrombie Pump Company, the special feature of which is the ease with which seats may be removed by hand without the use of a seat puller.

▪ ***Shear-Relief Valves***

Abercrombie Pump Company also has a working display of its several types and sizes of Shear-Relief Valves, ranging in sizes from 1¼-inch low-pressure to 3-inch high pressure.

Low Pressure Shear-Relief Valve



High Pressure Shear-Relief Valve

▪ ***Pressure Gauge***

A new type pressure gauge, developed along an entirely new principle from that employed in the conventional pressure gauge, will also be displayed. This gauge incorporates a diaphragm feature eliminating the possibility of drilling mud entering the gauge mechanism, and also incorporates a dampner which entirely eliminates the effect of pump stroke pulsations. This gauge unit is designed for a pressure range of from 0 to 5000 pounds per square inch.

Sonner Burner Company

▪ ***Burners***

Sonner Burner Company of Winfield, Kansas, is displaying two types of Sonner air-cooled burners. The burner develops a higher overload, and high efficiency, by using less gas and always supplying plenty of steam on low gas pressure with absolutely no injury to the boiler.

The deep-slot construction of the air-cooled burner-head permits the lowest possible turn-down without danger of flash-back, and the unusually large cooling surface in the burner-head prevents the deep slot from overheating. The units are completely automatic with respect to air control, and where used with a steam-actuated boiler-fuel governor require little or no attention.

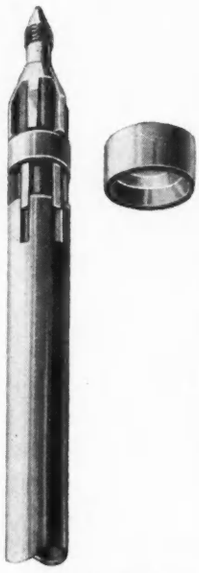
The burner is engineered for oil field service, built to stand abuse, and yet is sensitive to changing load conditions. It requires but a few minutes to install the burner in a boiler, as it is a simple matter to slide the chassis under the boiler, raise to the proper height, connect the gas line, and put the burner heads on the tubes. Made in sizes to fit all boilers.

Sonner Air-Cooled Burner

United States Heat Treating Company

▪ ***Core Barrels, Bits and Drill Collars***

United States Heat Treating Company, San Antonio, Texas, is displaying a full line of sizes of Pennington signaling core barrels, plug center bits, drill collars, hard and soft formation universal core catchers, hard and soft formation core drilling bits, with small sizes showing construction and manner of operation.



Pennington Signaling Core Barrel

Signaling, an exclusive feature of these core barrels, consists of creating a rise, or a fall, in circulating pressure as an indication to the driller. In pumping core tube down through the drill pipe, when it arrives on seat within the core drilling bit, ready for core, a signal—a loft in pressure—indicates the barrel is correctly seated to receive core, without delays, pumping, to make sure.

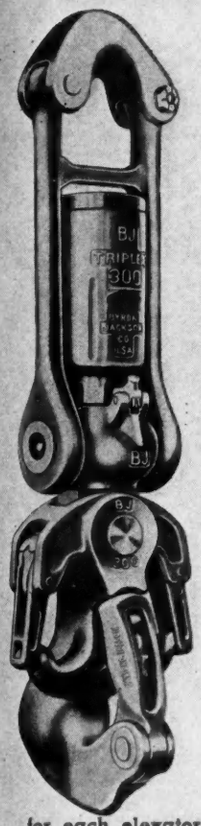
When the core tube is filled with core, pressure again lofts, a signal that it is time to retrieve, regardless of measurements made for depth on the drill collar. Should too much weight be let down on the core drilling bit, and "burn" the core, a signal again arrives, when the bit may be lifted, the core cleared, and core drilling is then resumed.

Signaling secures extreme rapidity in all the operations of core drilling, assures no loss of core section perfect operation.

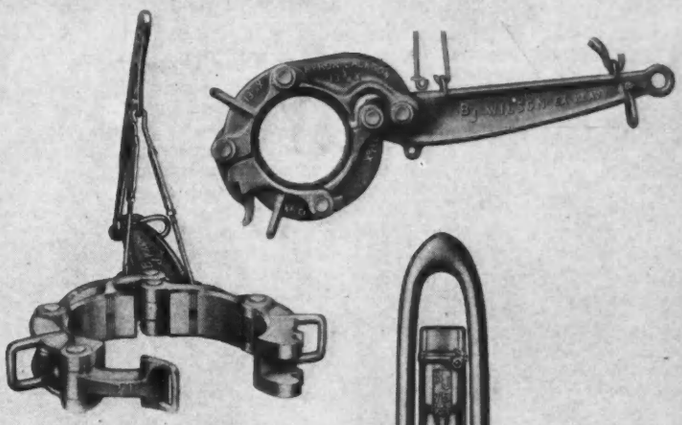
One foot, two foot, or any core length short of maximum may be cut, and when the required length is within core tube, a signal so indicates.

This equipment is leased or sold as desired.

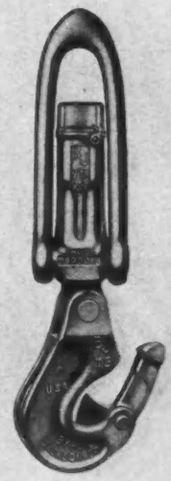
AT THE HOUSTON SHOW!



Drilling crews "prefer" BJ Triplex Hooks because of the separate hooks for each elevator link, and the swivel bail—all equipped with safe "locking arms" which provide extra strength and safety not otherwise obtainable. Why not give your crews the benefit of these modern advantages?

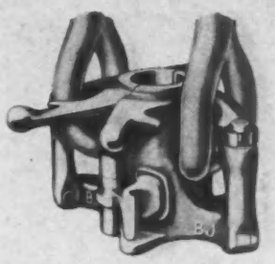


This new BJ Rotary and Casing Tong is an Extra-Heavy Type, fast in regular service, and amply strong for breaking out drill collars and other heavy duty service. Perfect contact around the circumference of the pipe permits BJ Tongs to grip securely without crushing.

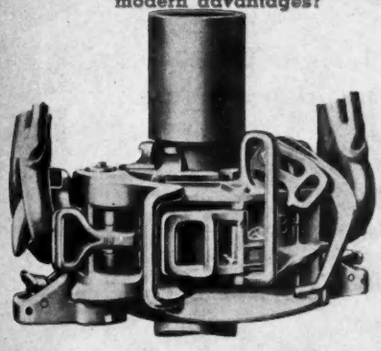


Since BJ offered three sizes of hooks designed exclusively for tubing work, hundreds of operators have junked old make-shift equipment, and are now enjoying the convenience of BJ Tubing Hooks, with "Locking Arm Safety." Above, the 30-ton; at left the 75-ton type.

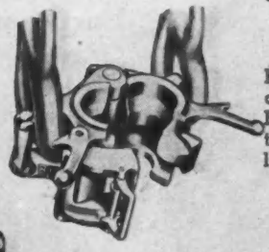
On pages 360 to 424 of the 1937 Composite Catalog you will find descriptions and prices of all modern BJ Oil Tools, or write us for free BJ Catalog.



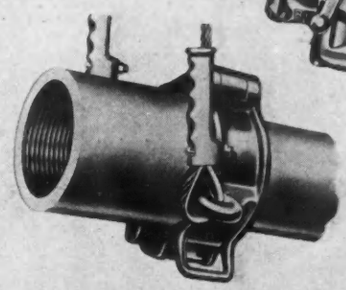
The fully heat treated body of this BJ Type A Center Latch Elevator does not upset under the pounding action of tool joints contacted at high speed. The protected latch—long guarded horns, and other features make it a favorite everywhere.



BJ Side-door Slip Elevators are easily removed while the cement is setting. They carry the load on four long slips; without lifting under the collar or coupling; they are easy to operate; and are safe for the longest, heaviest strings.



Bored to fit external upset drill pipe of the standard 18 degree taper, the BJ Type G Elevator safely carries the heaviest strings, without using lifting plugs. Made also in a Side-door model, Type B.



The BJ Type J Elevator is approved on sight by every crew. It replaces rope slings formerly used to "tail in" the next joint of casing. It weighs only 35 pounds in the 6⅝" size—sells for less than $50—and quickly pays for itself in time saved, injuries prevented, and the elimination of crossthreads.

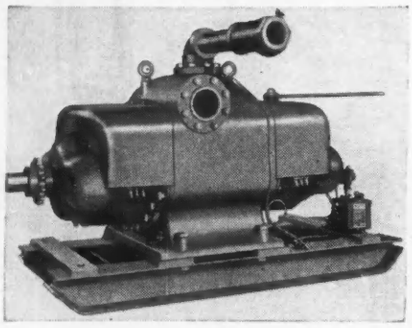
BJ DRILLING TOOLS

IN NEW YORK
John H. Baird,
420 Lexington Ave.,
New York, N. Y., U. S. A.

BYRON JACKSON CO.
2105 East Slauson Ave.,
Los Angeles, California
2505 Boaz Street,
Fort Worth, Texas

The Reed Roller Bit Company

The complete Reed line of rotary drilling equipment is on display in Reed Roller Bit Company's indoor booths. In the outdoor display the complete



Reed Rotary Engine Type No. 101

line of rotary engines and new pumping unit is exhibited. Listed below is a description of the rotary drilling tools to be shown:

▪ ***Reed D-K Rock Bits***

The combination ball thrust and roller bearing assembly provides more bearings under the cutters and hold them in true frictionless alignment. Various types of layouts will be shown, each designed to drill various formations most efficiently.

▪ ***Reed Tool Joints***

The complete line of Reed Tool Joints are shown, which includes the Reed API. Full Hole; Reed API Regular; Reed Shrink-Grip Tool Joint on Special API internal upset drill pipe; Reed Shrink-Grip Internal Flush Tool Joint on internal flush, external upset drill pipe; Reed Double Grip; Reed Double Grip Internal Flush Tool Joint

Reed Tool Joints

in Pittsburgh Special double grip drill pipe; Reed Shrink Weld; Reed External Flush Shrink Weld; Reed External Flush (Sheldon-Burden type).

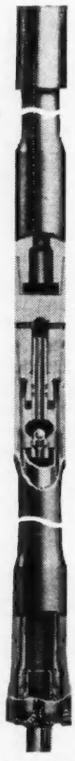
▪ ***Reed Reamers***

The bearing blocks holding the reamer cutter assembly are especially case hardened and embedded into the reamer body by welding, so that there are no loose parts to be lost in the hole while drilling.

▪ ***Reed Kor-King Core Drills***

An entirely new principle in core drill manufacture. A few of the advantages of the core drill are: non-rotating inner barrel, non-rotating core catcher; outside vent, releasing the pressure above the core; improved rust-proof toggle type core catcher, core catcher protector, increased diameter cores; core drill elevator, eliminating handling with cat-line.

Reed Reamers



Reed Kor-King Core Drill

▪ ***Reed B-R Bit and Core***

Also shown is the Reed B-R drilling bit with wire line (retractable) barrel. With the Reed B-R any number of cores may be taken, regardless of depth, without removing the drill stem.

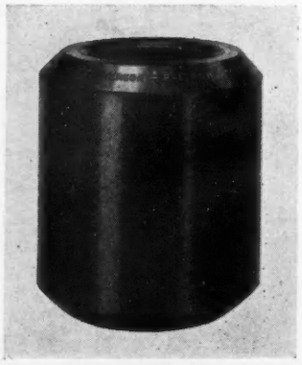
▪ ***Other Products***

Other products of Reed Roller Bit Company on display include: Welded-in blade bits; replaceable blade fishtail bits; basket bits; substitutes; and drill collars.

Patterson-Ballagh Corporation

▪ ***Casing Protectors, Stabilizers, etc.***

Patterson-Ballagh Corporation, Los Angeles, is showing its complete line, which comprises casing protectors, stabilizers, wire line guide, swivel bump-



Drill Pipe Stabilizer

Patterson-Ballagh Wire Line Guide

ers and mud gun. The company is also showing its installation equipment used in the installation of casing protectors. Also on display is the equipment used in the removal and salvaging of the protectors.

Exhibited is a working model of its wire line spooler and an exhibit that shows the views taken in the factory. This exhibit will tell the complete story of the manufacture of the casing protectors from the raw material to the finished product and the steps taken and care used in the manufacture of these protectors and Patterson-Ballagh rubber.

The International Derrick & Equipment Company

The International Derrick & Equipment Company, Beaumont, Texas and Columbus, Ohio, is exhibiting a complete line of rotary drilling equipment and also a number of geared pumping machines which will be operated under power during the exhibit.

▪ ***Drilling Equipment***

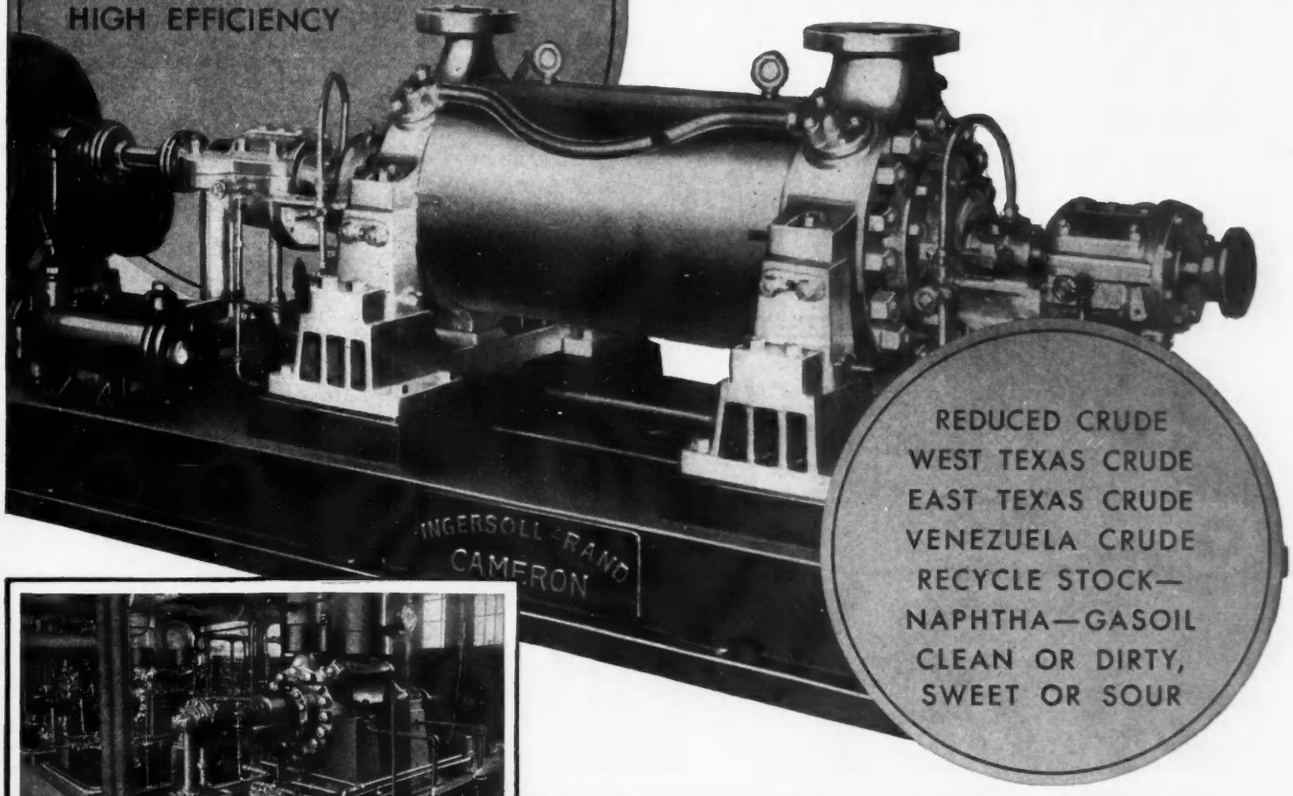
The rotary drilling equipment is manufactured at the Beaumont plant. It is being used in many fields throughout the oil world but is particularly popular in the Gulf Coast areas. This exhibit consists of a Big Giant Drawworks, Little Giant Drawworks, 27½-inch bobtail oil bath rotary, 27-inch make-and-break rotary, 23-inch bobtail oil bath rotary, speeder upper, super duty crown block, super duty traveling block, 6-inch swivel and 8-inch swivel.

▪ ***Geared Pumping Units***

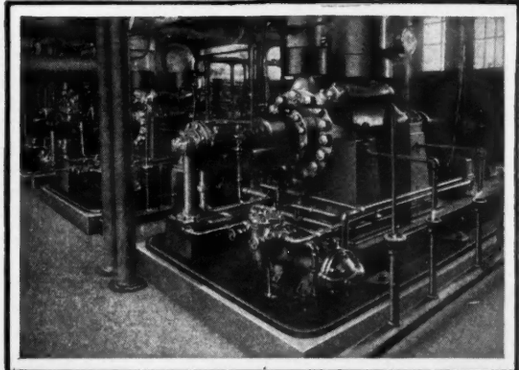
The geared pumping machines are manufactured at eight plants located at various points in the United States. The main plant is located at Columbus, Ohio. The units exhibited are representative of a full line of geared pumping machines and central power equipment, hundreds of installations of which have been in service for many years in

CAMERON
HOT OIL
CHARGING PUMP

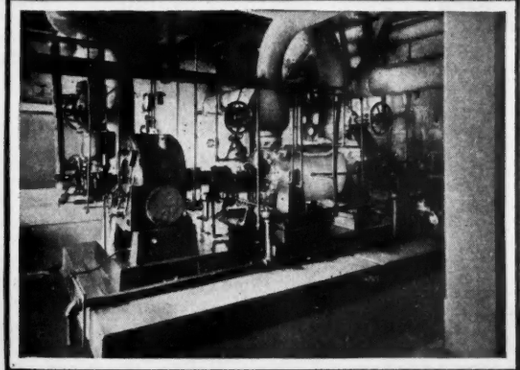
TEMPERATURES TO 800°
PRESSURES TO 2,000 POUNDS
NON-PULSATING FLOW
HIGH EFFICIENCY



REDUCED CRUDE
WEST TEXAS CRUDE
EAST TEXAS CRUDE
VENEZUELA CRUDE
RECYCLE STOCK—
NAPHTHA—GASOIL
CLEAN OR DIRTY,
SWEET OR SOUR



Three 5-stage Class AHT Hot Oil Charging Pumps in a Western refinery



This unit has given faithful service for nearly 50,000 hours. Three duplicate units have been in operation for almost the same period

Built especially to stand up under the severe punishment of handling hot oils in cracking-coil charging service.

The fact that there are many Cameron Hot-Oil Pumps which have long performance records without cost for dismantling or repairs is conclusive proof of their correct design.

Listed below are several highlights of the AHT design:

1. The AHT pump can be dismantled in the least time and with the least labor.
2. The balancing drum and sleeve can be inspected or renewed without breaking a high-pressure joint.
3. Every detail involved in field dismantling and assembly has been carefully and thoroughly studied to eliminate difficulties due to coking of parts during thousands of hours of service.

Full details are given in Bulletin No. 7065.

Ingersoll-Rand

CAMERON PUMP DIVISION
11 BROADWAY, NEW YORK CITY

421-10

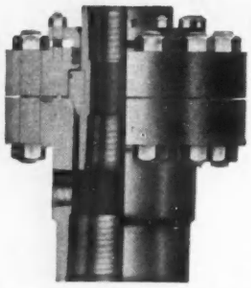
The RECTORHEAD Booth

IS A DISPLAY OF

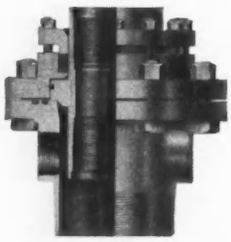
SAFETY

in the Drilling and Producing of

Oil and Gas Wells



Type "EH" 10,000-lb. test
(Forged Steel)



Type "H" 6,000-lb. test
(Forged Steel)

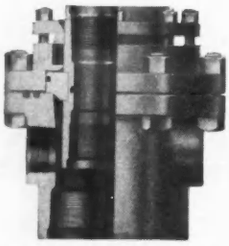
and hundreds of

SATISFIED USERS

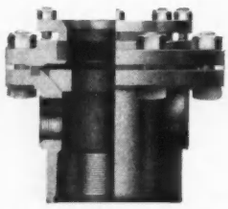
attending the

OIL-WORLD EXPOSITION

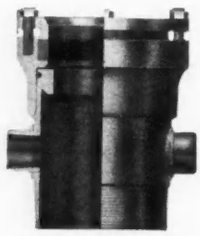
will tell you so!



Type "M" 3,000-lb. test
(Cast Steel)



Type "L" 1,500-lb. test
(Cast Steel)



Type "C" 1,000-lb. test
(Semi-Steel)

RECTOR WELL EQUIPMENT COMPANY, INC.
FORT WORTH.....TEXAS
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MIDLAND CORPUS CHRISTI

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the various producing fields, the manufacturer claims.

A light self-contained floor-type machine will be displayed. This machine is mounted on steel skids and is equipped with a gear box, twin cranks with rotary counterbalances, brake and fly wheel, V belt drive, prime mover, twin pitmans with upper bronze and lower roller type bearings, tripod samson post with oil bath pivoted equalizing cross beam, hinged type mule head and double cable beam hanger.

A vertical geared power will also be shown. This outfit consists of a gear box with front and back crank, each of which operates a push-and-pull pitman to a stroke post from which a rod line operates an underpull pumping jack. This entire outfit will be operated under power during the course of the exposition.

Osage Metal Company

▪ ***Metals***

On display in the Osage Metal Company exhibit is tungsten, carbon, and cobalt—the components which are combined electrically in the manufacture of Osage metals.

Several of the outstanding advantages attributed to this new method developed by Osage are: it saves time, reduces operating costs, and increases efficiency, all which have been proved by actual and practical use, Osage officials say.

A display of Osage acetylene metal amalgamated rod, Osage Tube metal, Osage inserts, and Osage A and B hard facing rods, (both electric and acetylene) round out the Osage exhibit.

Tom Sharp, Inc.

Cavins Hydraulic - Suction Bailers and Sharp Screen and Perforation Washers are being featured in the exhibit of Tom Sharp, Inc., of Houston, Texas. A brief description of the two lines follows:

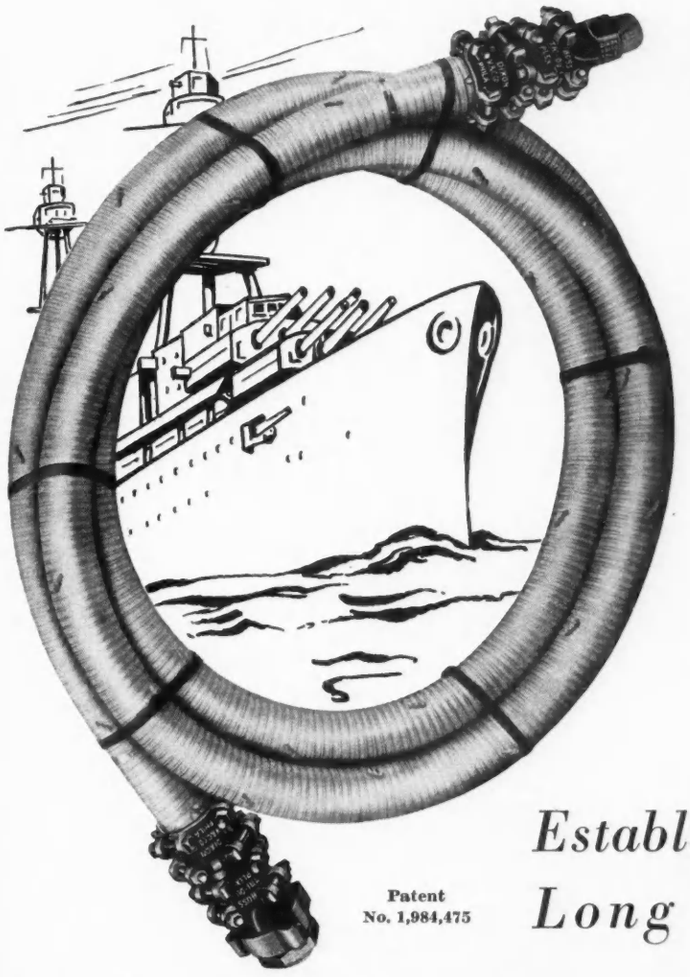
▪ ***Cavins Automatic Hydraulic-Suction Bailers***

A full line of hydrostatic bailers equipped with heavy duty jars, pressure release valve and sleeve type bottom, featuring automatic loading, automatic dumping and streamlined flush joint construction of the fine material and workmanship. Operates under all pressures, will remove sand, mud, paraffin and small pieces of iron from bottom of the well. Sizes range from 1¾-inch O. D. to 4¾-inch O. D.

▪ ***Sharp Screen and Perforation Washer***

Designed for safe but positive removal of clogged conditions in close mesh screen or perforated pipe, these tools can be run on tubing or sand line and are composed of three principal parts: air chamber, fluid control and anchor. The air chamber provides the means of converting the hydrostatic pressure of the fluid column into usable power. The fluid control directs the power developed to force fluid through opening in strainer. The anchor provides a positive means of setting the tools at any desired point in the liner. Sizes for 2¾-inch I.D. to 6⅝-inch I.D. Screens are available.

All Battleships Are, of Course . . . But



Patent
No. 1,984,475

There's Only ONE COMPLETELY ARMORED ROTARY HOSE

"G.S.M."

(GOODALL SEMI-METALLIC)

Establishes New Records for Long Life and Economy!

Every factor that ordinarily contributes to failure in Rotary Hose has been eliminated in "G.S.M." to an extent that provides an amazingly new measure of strength, durability and safety!

"G.S.M." Rotary Hose is completely shock-proof, because *every ounce of pump pressure is carried by steel and steel alone!*

The tube which conveys the slush mud is made of a compound especially designed to withstand abrasion. The rubber and duck carcass, of special materials, bonds the tube to the structural steel members and acts as a shock-protecting cushion against sudden impulses and surges of pressure.

The layers of braided steel tapes, built into the body of the hose (patented), are completely impregnated with rubber, and further insulated with rubber and duck. These layers of steel carry all the longitudinal pressures on the hose. All radial pressures are effectively resisted by the patented "G.S.M." galvanized steel Ball-Joint ARMOR, which entirely encases the hose in a flexible steel jacket. Thus, full protection is provided against both *internal* and *external* abuse and abrasion. The ends of all "G.S.M." Rotary Hose are reinforced with additional steel members, giving extra strength at these critical points.

Despite its rugged construction and great strength, "G.S.M." is exceptionally light in weight and surprisingly flexible. It is made in all needed sizes—either straight or enlarged ends.

Order from your Jobber or Supply House or write direct for further information

GOODALL SEMI-METALLIC HOSE & MFG. CO.

165-171 WEST COLUMBIA AVE., PHILADELPHIA, PA.

LOS ANGELES HOUSTON

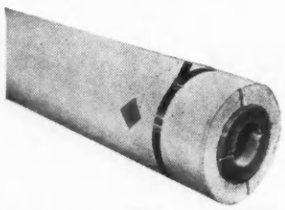
Keasbey & Mattison Company

▪ ***Asbestos-Magnesia Insulations***

For temperatures to 600°F., K&M "Featherweight" Magnesia Insulation is offered as the insulating material. Blocks and lagging make it possible to efficiently insulate flat, curved and irregular surfaces.

For temperatures to 1900°F., Hy-Temp Insulation is recommended. Maintains high efficiency from 600°F. to 1900°F. Furnished in section, block and lagging form.

Hy-Temp Combination Pipe Insulation is composed of an inner layer of Hy-Temp in combination with an outer layer of "Featherweight" 85 percent Magnesia. This combines the greater insulating efficiency of the "Featherweight" with the high heat resistance of the Hy-Temp. Hy-Temp Combination is efficient up to 1900°F.



Hy-Temp Pipe Installation

Gray Tool Company

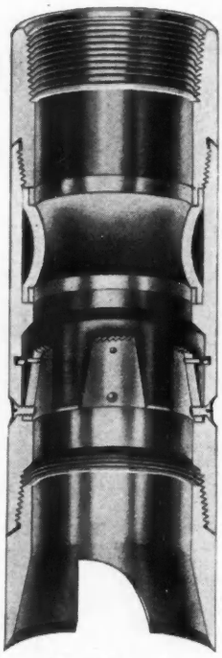
Gray Tool Company is exhibiting its full line of equipment in booths 444-446-448-545-547-549.

▪ ***Gray A.S.A. Systems of Well Control***

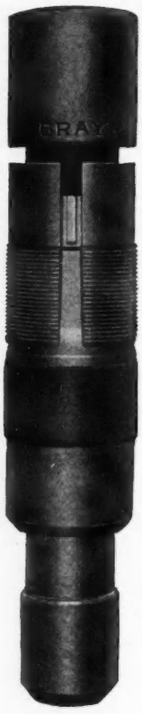
Gray A.S.A. Systems of Well Control offer a means of control from the time the casing head is first put on the well, taking the following stages in sequence: drilling, running casing, cementing, removing drilling equipment, drilling in and running tubing, removing control equipment and attaching manifold. The system is flexible, as it may be changed during drilling, casing and completing operations as desired without affecting the basic control assembly. Related parts allow arrangements to be altered as desired and always remain in effect a unit.

Economy is claimed, as only the essential parts are left in the final structures. As pressures decrease excess parts may be removed. All parts may be repaired and reinstalled when necessary.

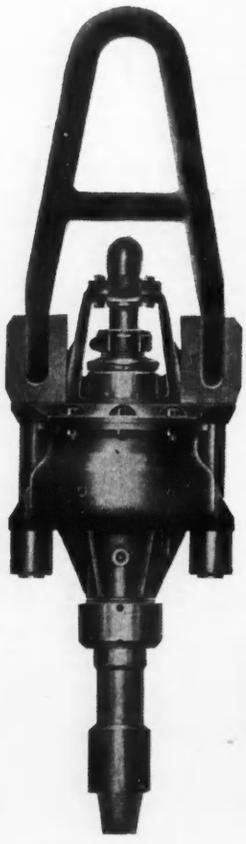
Gray Well Control



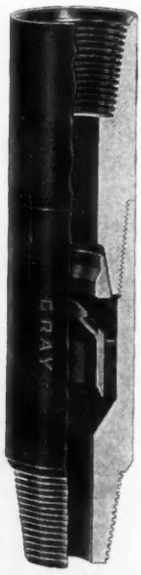
Gray Overshot



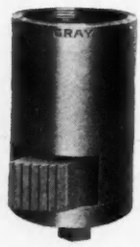
Gray Packer Spear



Gray Swivel



Inside Blow-out Preventer Float Valve



Back-Up Tool

▪ ***Gray Rotary Fishing Tools***

Among the Gray rotary fishing tools on exhibit is its packer type release spear, which is positively releasable by means of powerful screw jacks built into the spear. With the packoff attachment, circulation can be forced around the fish, thus greatly increasing chances of pulling. If the fish wont come loose, the spear can be released and the hole cleared so that other tools may be run.

Also displayed is the Gray packer type overshot with release dogs. Large clearance allows tool joint to pass through this tool. Consequently, a slivered, out-of-round fish will almost always pass through, allowing the dogs to fall in under the collars. This adjusting of the dogs to out-of-round fish eliminates the necessity for milling fish to a perfect circle.

▪ ***Gray Rotary Drilling Tools***

Being shown is the Gray Type "B" swivel, which has a strength of 422,000 pounds at 100 revolutions per minute. An original feature is said to prevent distortion and subsequent misalignment. The strength in the radial bearings is claimed to be sufficient to maintain the degree of alignment necessary to avoid packing troubles.

The Gray automatic inside blowout preventer and float valve for preventing well blow outs through the drill pipe also is on exhibition. The valve automatically closes when the pressure of the well becomes greater than that of the pumps. Used as a float valve it saves wire lines, brake bands, and other rig equipment.

The Gray back-up tool, also being shown, is a strong, practical tool for backing up strings of casing while the top joint is unscrewed for spacing and nippling-up and for making-up pipe and fittings.

Westcott and Greis, Inc.

The exhibit of Westcott and Greis, Inc., of Tulsa, consists of the equipment of American Meter Company, Erie, Pa.; S. R. Dresser Manufacturing Company, Bradford, Pa.; Chaplin-Fulton Manufacturing Company, Pittsburgh, Pa.; The Bristol Company, Waterbury, Conn.; Davis Regulator Company, Chicago; Buffalo Meter Company, Buffalo, New York; Robinson Orifice Fitting Company, Los Angeles; and Reliance Regulator Company, Alhambra, Calif.

▪ ***American Meters***

American Meter Company equipment in the Westcott and Greis, Inc., exhibit includes the following:

Metric orifice meter, recording and integrating;

Metric volume controller for the control of gases and liquid;

Metric long distance air actuated indicator and recorder for the transmission over a long distance of chart records; Metric large and small ironcase

AND HERE THEY ARE

★ ★ ★

Deeper

SUGGESTED SETTING DEPTHS

. . . AND LIGHTER WEIGHT

● You asked for a casing that could be set SAFELY at greater depths. You asked for a casing that would be lighter in weight. Here it is:—Republic Alloy Steel *Heat-Treated* Casing.

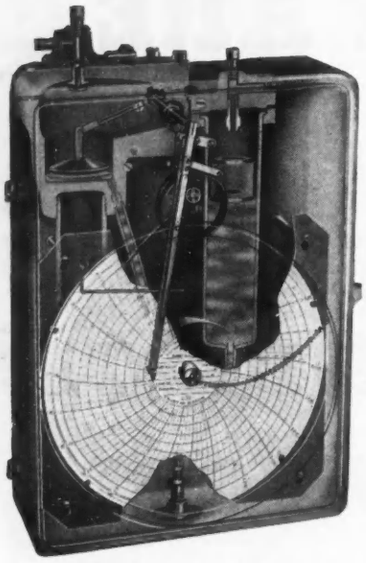
Because, as the name implies, it is made of special alloy steel and *heat-treated,* this new casing possesses unequaled high compression yield strength with high tensile strength and ductility. It provides greatly increased resistance to collapse without increase of wall thickness. It minimizes the hazard of casing failure in deep hole drilling.

Republic Steel *Corporation*

REPUBLIC STEEL

GENERAL OFFICES . . . CLEVELAND, OHIO

HEAT-TREATED CASING



Westcott Orifice made by American Meter Company

positive meters for both field and city measurement of gas and other instruments applicable to the correct measurement of gases and liquids.

▪ *Reliance Regulators*

Reliance Regulator Corporation regulators, including those for house service, field service and for both high and low pressure control, are shown in the Westcott and Greis, Inc., booths. All these regulators are for the proper control of gases.

▪ *Robinson Orifice Fittings*

Robinson Orifice Fitting Company is showing its Type E fitting, which has been completely redesigned. Simplicity of operation, expert workmanship, and use of fine materials are said to feature its design.

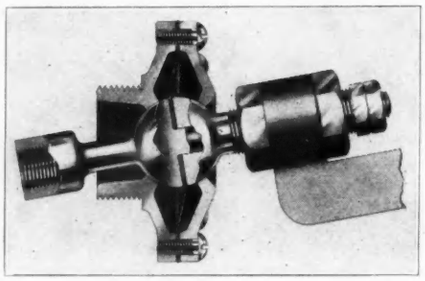
In the Type E fitting, the main operating mechanism is housed in the upper chamber and consists of a stainless steel stationary screw and a follower nut pivoted to the orifice plate carrier. This device raises and lowers the orifice plate carrier in position and assures positive centering of orifice plate in the line. A stainless steel diaphragm sealing member forms a smooth flush bore from both the upstream and downstream face of the orifice plate.

The orifice plate carrier is automatically lifted out of side of fitting, making replacement of plates convenient and easy.

▪ *Davis Regulators*

Davis Regulator Company, Chicago, has the following products on exhibit in the Westcott and Greis, Inc., display:

Liquid level controllers and control valves equipped with a patented packless head known as the Davis diaphragm ball arm. The unit replaces the conventional ball bearing rotary stem packing box, it is claimed. The Davis diaphragm ball arm is a packless unit consisting of a diaphragm suitable to withstand the chemical action and possible high temperature of the liquid with which it comes in contact, and a ball with an extended stem that rocks in a socket. The ball is in halves and is secured tightly to the diaphragm by a nut on the end of the protruding stem on which the lever bracket is mounted. There is no



Davis Diaphragm Ball Arm

leakage through it. Suitable for pressures up to 300 pounds and temperature of 450°F. or less.

The Davis diaphragm motor valve and pressure regulator, as well as the Davis No. 330 gas back-pressure valve, are included in the exhibit.

▪ *Buffalo Meters*

The exhibit of Buffalo Meter Company consists of samples of its cold water, disc type displacement meters and also displacement type gasoline meters and high and low pressure displacement type oil meters.

▪ *Chaplin-Fulton Regulators*

Chaplin-Fulton Manufacturing Company is showing its line of high and low pressure gas regulators.

▪ *Bristol Controls*

The Bristol Company is showing its new moisture proof Model 40 recording gage for the proper recording of pressures of all descriptions, and also the following:

Bristol's recording thermometer fully compensated type for the recording accurately of temperatures in gas pipe lines.

Bristol's Metameter receiver which shows the proper recording of pressures transmitted over a long distance.

Bristol's Pyromaster recorder controller, which shows the proper records of automatically controlled pressures and temperatures.

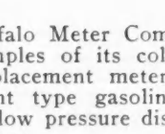
Bristol's strip type Potentiometer record for the proper recording of temperatures.

Bristol's Model 22-M portable recording gauge for the accurate recording of pressures on a portable basis.

▪ *Dresser Couplings*

S. R. Dresser Manufacturing Company is displaying a number of its couplings and clamps, among which are the following:

Dresser Style 85 fittings are unique, flexible, self-contained pipe joints that eliminate pipe threading. To install, the plain-end pipe is stabbed into the fitting, which comes assembled, and end nuts are tightened, which in turn compress a resilient gasket tightly around each pipe end, firmly sealing the joint, yet allowing movement of the pipe, thus absorbing expansion, contraction, settling, etc. A wrench is the only tool necessary. A complete joint can be made in one or two minutes. The Style 65 line includes regular couplings, long couplings, 45° ells, tees, adapters, caps, etc.



Dresser Style 65

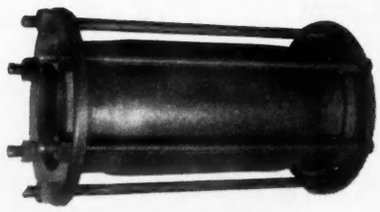
Dresser steel pipe coupling, Style 38, makes permanently tight, flexible connections between plain-end pipe. It is made up of standard parts that are quickly assembled. A wrench is the only tool necessary. Installation time varies from six minutes on a six-inch size to

Dresser Style 38 Couplings. Heavy-duty on left and light-wall type on right.

12 minutes on a 20-inch size. Strength can be varied to meet the working pressure of any line.

Dresser steel pipe coupling, Style 38 for light-wall steel pipe is like the regular Dresser Style 38 coupling, but has lighter component parts for use on light-wall steel pipe.

Dresser long sleeve, Style 40, connection is like the Dresser Style 38 coupling, except that it has a longer body for spanning variations in the space between pipe ends.



Dresser Style 40 Long Sleeve

The Dresser collar clamp, Style 41, is a repair device that is made up of a few standard parts. It is for the prevention of leaks of threads of screw joints (screw collars or screw couplings) on steel pipe. Quickly installed in a moment or two, using only an ordinary wrench.

Dresser Style 41

Dresser Style 55

Dresser porous-weld clamp, Style 55, is a repair clamp for stopping porous circumferential welded joints on steel pipe. Installation requires only the as-

MAXIMUM PENETRATION
YARBROUGH GUNS
MAXIMUM SAFETY

The Yarbrough Gun Perforating Service is as complete as it is safe. Service Trucks arrive at the well with ALL equipment required to do the job. This equipment has been developed by company engineers to make perforating faster, safer, and more dependable than it ever has been before. For full details send for Bulletin No. 10.

Maximum Penetration

is obtained through the use of the best quality steel, heat treatment, and the correct design and ballistic balance of powder charge, sealing device, shear cup and bullet. This balance is the result of careful testing over a period of years. Many wells have been successfully perforated through two and three strings of casing; while thousands of feet of Grade "D" and German Seamless casing have been shot successfully.

Maximum Safety

IS ASSURED BECAUSE —

1. The shooters are experienced well men who are experts in all phases of Yarbrough Gun Perforating Service.
2. The testing instruments require that the gun be entirely detached from shooting cable and firing controller prior to use.
3. Yarbrough Guns firing controls are so arranged that premature or accidental discharge is impossible.
4. Only alternating current at a definite potential in excess of that used for rig lighting can fire the Gun. Static electricity and direct current will not cause it to fire.
5. The Yarbrough Gun does not use caps or detonators.

The Yarbrough Guns Company is fully licensed under the basic Mims Patent No. 1,582,184, issued April 27, 1926, also under other patents and patents pending.

YARBROUGH GUNS CO.

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A Kibele Swab Brought in this East Texas Well

You Know
A Kibele SWAB is coming up
With a Load

WHETHER YOU GET UNDER MUCH OR LITTLE FLUID,

The **KIBELE SWAB is built**

So that the **CONTROLLED PRESSURE**

(1) Expands Flexible Cups Firmly;
(2) Compensates for Wear;
(3) Prevents By-Passing.

NO FRICTION AGAINST PIPE OTHER THAN RUBBER AGAINST METAL—SIMPLY CONSTRUCTED DEPENDABLE—LONG-WEARING

All the Speed It's Safe to Use

For Sale at All Supply Stores
Along with Kibele Pistons, Tubing Catchers, and Packers

Kibele 2-Cup Tubing Swab
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sembly of several standard parts around the pipe and bolting together.

Dresser screwed-fitting clamp, Style 74, is another repair device. It is used for stopping leaks through the threads of companion flanges, and other threaded fittings, such as ells, tees, etc. It consists of a few standard parts, quickly installed with a wrench.

Dresser Style 74

Dresser Style 77

Dresser band clamp, Style 77, repairs small holes, pits, etc., in the barrel of the pipe. It is made up of a circular band, tightened around the pipe by drawing up a bolt.

Dresser split repair clamp, Style 79, Type 2 is made in sizes from three inches long up. Lengths of defective pipe are covered and repaired with this clamp, which consists of a half shell,

Dresser Style 79 Repair Clamp

curved to fit the pipe, and pulled up against the pipe with stirrups. A flat gasket is used. A Type 1 is available also, using two half shells and straight bolts.

An interesting part of the Westcott and Greis exhibit is an actual demonstration of Dresser flexibility, consisting of a Style 65 coupling installed on pieces of pipe that are deflected up and down by a motor. The pipe is filled with water and air at a pressure of approximately 100 pounds per square inch. Synchronized with the flexing movement of the coupling is a long arm or pointer, swinging from side to side, pointing at the words "flexible" and "tight," which flash on and off. A counter keeps track of the number of times the coupling is deflected. On previous tests of this nature, the coupling has proved able to withstand the pipe movement more than 100,000 times through an arc of 4 degrees.

Maintenance Engineering Corporation

▪ ***Meters, Fittings, Valves Controls, etc.***

Maintenance Engineering Corporation, Houston, is exhibiting materials of its own manufacture, including a unitized firing control for oil field boilers, sectionalized meter runs, mud line fittings, flange unions, mud line pulsation dampner, alloy-steel bolts, and Christmas tree welded tees and crosses. There also are photographs and drawings on high-pressure distillate well control systems, sectionalized drilling rig piping, feed water pump units, etc.

Firms represented by Maintenance Engineering Corporation as agents and

distributors also are in the company's booth. These include the following:

▪ *Mason-Neilan Controllers*

In the Mason-Neilan Regulator Company section there is a panel board with all the various types of recording and indicating controllers for temperature, pressure, flow and liquid level. Also are sectionalized regulating valves and float chambers for pressure and level services. The new air-operated potentiometer type temperature controller also is on display.

▪ *Tube-Turns*

Tube-Turns, Inc., has a section featuring its seamless 90° and 180° Tube-Turns; also welding fittings, including reducers, tees and welding heads.

▪ *Philadelphia Steel Flanges*

Philadelphia Steel & Iron Company is showing a pyramid of forged steel flanges, and an assortment of high-hub butt welding flanges in the Maintenance Engineering Corporation booth.

▪ *Bonney Welding Connections*

Bonney Forge & Tool Works has a display consisting of a pipe fabrication showing the advantages of Weldolets and Thredolets for making welded branch connections.

▪ *Commercial Orifice Fittings*

Commercial Iron Works is featuring four of its Commercial orifice fittings—one regular fitting with rising stem elevator; one twin place orifice fitting with rising stem elevator; one type CN orifice fitting with non-rising stem elevator; and one Deadline orifice fitting. Aluminum models also are included in the exhibit.

▪ *Ashton Dial Gauges and Valves*

Ashton Valve Company is presenting a display of dial gauges, pop safety valves and relief valves, including a six-inch high-pressure gauge, a six-inch oil industry gauge, and a No. 23 relief valve for use where acids and other corrosive chemicals may be present.

▪ *National Tubes*

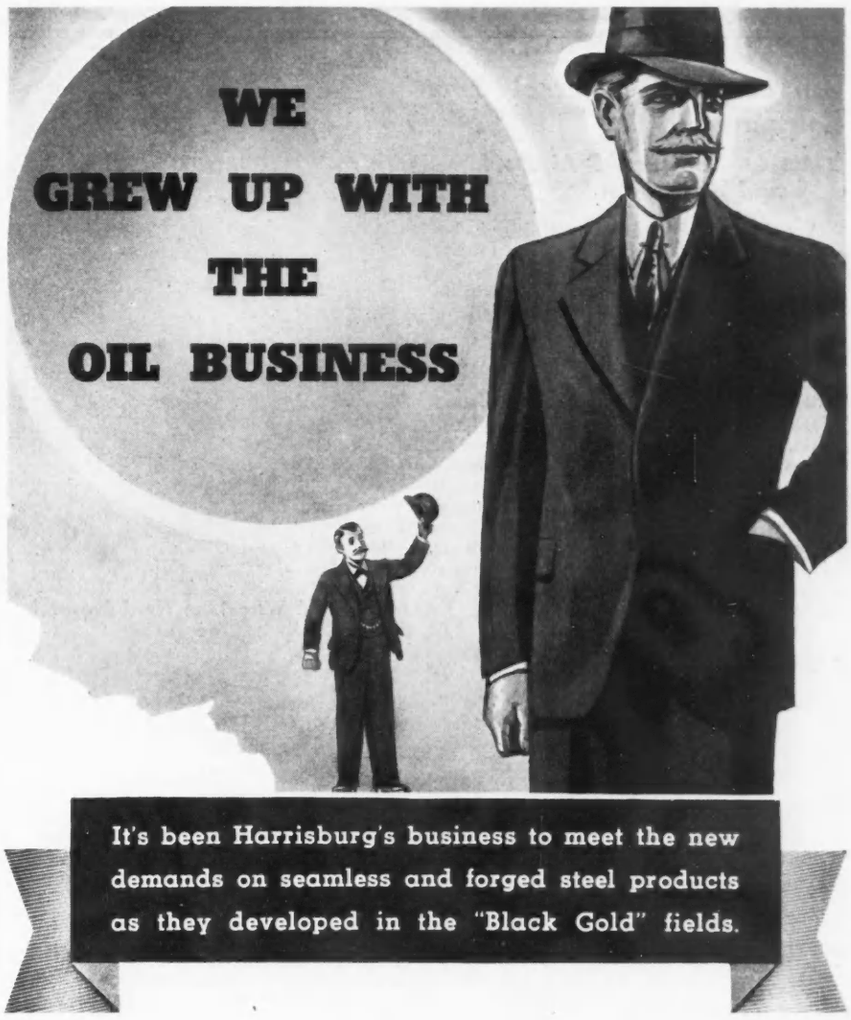
National Tube Company has in the Maintenance Engineering Corporation exhibit a sectionalized display of various still tubes, including 18-8, 4-6 Chrome ½ Moly, 2 percent Chrome ½ Moly, tubes with upset ends; also steel exchanger tubes, both copper lined and copper clad; and samples of Duroline (cement-lined) pipe.

▪ *Edwards Valves*

Edwards Valve & Manufacturing Company, Inc., besides its own exhibit in booth 710, is also with Maintenance Engineering Corporation. In the latter, forged steel globe valves, flanged and screwed cast steel globe valves and cast steel non-return valves for oil well boilers are being shown.

▪ *Vogt Valves*

Henry Vogt Machine Company is showing forged steel gate valves, globe valves and forged steel fittings. This concern in addition has an exhibit in booth 715.


WE
GREW UP WITH
THE
OIL BUSINESS
It's been Harrisburg's business to meet the new demands on seamless and forged steel products as they developed in the "Black Gold" fields.

. . . WE'RE just eight years older than the oil industry, which Col. Drake fathered in 1859. Among octogenarians, what's eight years? . . . Born near our neighborhood in Pennsylvania we were old enough to help do the nursing of this delicate infant. Imagine our astonishment as we watched and helped with the tutelage of this giant of the present-day industrial world. Imagine the pride we feel in being able to say of this industry, "We knew it when" . . . and the satisfaction we get out of its leaders' genuine expressions of gratitude for Harrisburg's many contributions to the oil industry's metallurgical and technical advance. . . . With the latest of laboratory and plant facilities, Harrisburg is today more able than ever to furnish, in types to meet the peculiar needs of the oil fields, the following seamless and forged steel equipment: drop forged steel pipe flanges; seamless steel pipe couplings, pump liners, bull plugs, plate-made cylinders; coils, bends; drop and hollow forgings; alloy and carbon steels. :: Harrisburg, Pa.

Universal Core Barrel Company

▪ ***Barrett-Robishaw Whipstock and Milling Tool***

Among the products exhibited by Universal Core Barrel Company, Houston, in Booths 652 and 654, is the Barrett-Robishaw whipstock and milling tool, which is said to assure a clean, long window and positive control.

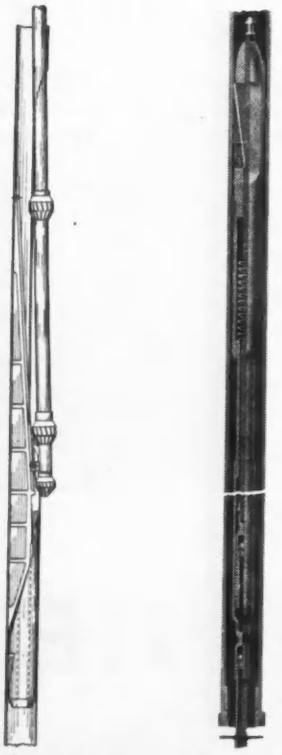
The whipstock has a deflected track running from the upper end to the milling out point. The milling tool has a stationary bearing between the two mills, which is set keyways into the whipstock tract. This affords a means of holding the mills to the track and eliminating the danger of the mills moving away from the desired drilling direction. The milling tool rides clear of the whipstock and the entire milling action is on the casing and never on the whipstock.

▪ ***Barrett-Robishaw Wire Line Fluid Tester***

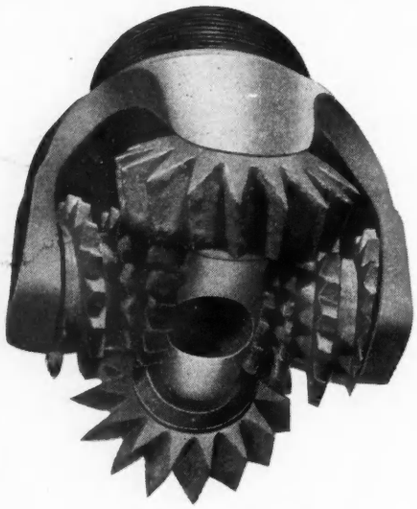
Another product displayed by Universal Core Barrel Company is the Barrett-Robishaw wire line fluid tester, which has been developed to recover fluid samples from below the bottom of the hole so that they are free from drilling fluids.

The fluid tester is dropped into the drill stem from the derrick floor and locks into position with the end of the tester extended beyond the cutting edge of the core bit. The core drill is then rested on the bottom of hole, sealing off drilling fluids and forcing extended end of tester into the underlying formation.

A fishing tool is then lowered into the drill stem which contacts spearhead on the fluid tester. When the wire line tightens to come out of the hole the inner cup of the tester is pulled upwards, creating a suction which fills the tester with the fluid in the formation and a ball and seat in the bottom of the tester holds the fluid in the cylinder. Continued tightening of the wire line releases the locking device and the fluid tester and fluid sample are recovered.



Left: Barrett-Robishaw Whipstock and Milling Tool.
Right: Barrett-Robishaw Wire Line Fluid Tester.



Universal Wire Line Hard Formation Core Bit

This core bit was designed and built by the Universal Core Barrel Company to operate in the hard formations encountered out of the Gulf Coast. It has been successfully used in all formations where rock bits are required. With this bit it is possible for operators to drill full size hole and recover cores through the drill stem in any part of the world.

These hard formation core bits can be furnished in all sizes from 6½ inches to 12¼ inches.

McCullough Tool Company

▪ ***Gun Perforator***

The exhibit of McCullough Tool Company in Booth 1322 is centered around the McCullough gun perforator, a mechanically fired tool used to perforate casing in the well.

▪ ***Other McCullough Products***

In addition, the McCullough display includes: Double-acting rotary jars; internal casing cutters; drill pipe cutters; rotary releasing spears; rotary releasing sockets, and a number of special drilling and firing tools.

Peerless Pump Company

▪ ***Turbine Pumps***

Peerless Pump Company, Los Angeles, exhibiting with its representatives, M. N. Dannenbaum Company of Houston, is showing its water well turbine pumps.

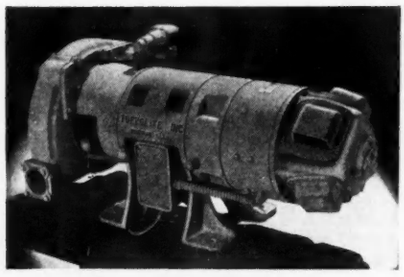
These pumps are of the enclosed lineshaft, oil lubricated type. High efficiency and long life are said to be a characteristic. The impellers are non-overloading, each hand-finished and balanced. The non-whipping shaft is of turned ground and polished steel. Shaft bearings are closely spaced, usually five feet. Lubrication from water cooled reservoirs is automatically controlled. In the Moturbo type head, the most popular type, the main bearing is located directly on the pump base, attaining exceptional stability by carrying the entire hydraulic load below the motor. Lubrication is by constantly cooled and circulated oil.

Turbolite, Inc.

In the Turbolite, Inc., Houston, Texas, booth the following items are on display:

▪ ***Two-Unit Direct-Current Turbo Generators***

The Turbolite Type MG, two-unit direct-current turbo-generators consist of center casting with tee to which an impulse type steam turbine and a direct-current generator are bolted, one on either end. Both turbine and generator are complete units in themselves, the turbine driving the generator through a pin-and-bushing type flexible coupling. Either unit may be removed from center casting without disturbing the other, by taking out four bolts. This feature facilitates repairs or replacements when required. Accurate alignment and smooth operation is insured by turned babbit fits between bearing brackets and center casting. Due to turbine and generator being separated, there is little possibility of steam or condensation coming in contact with electrical parts. Supplied in 4, 5 and 7½ kilowatt capacities.



Turbolite Two-Unit Turbo Generator

▪ ***Turbolite Belt-Driven Turbo Generators***

Turbolite Type MBD turbo-generators consist of a direct or alternating-current generator mounted on a structural steel base and driven by an impulse type steam turbine through

V-Belt drive. A switch box containing switches, rheostat and volt meter is mounted on generator. Supplied in 10 kilowatt capacity.

▪ ***Turbolite Type BM Mechanical Drive Turbines***

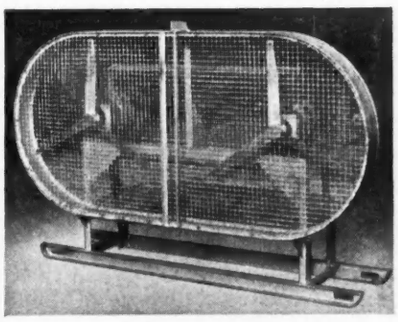
Turbolite mechanical drive turbines are suitable for operating pumps, blowers and various other apparatus, either direct connected or through V-Belt drives. Supplied in vertical type for operating centerifuges. Built in sizes of from 3 to 15 horsepower.

▪ ***Turbolite Type BFM Turbine-Driven Pumping Unit***

Consists of two-horsepower steam turbine direct-connected to rotary pump for pumping crude oil through meter. Is used in connection with automatic float regulator. These are operated by gas or steam.

▪ ***Lacy Bug Fans***

Lacy bug fans are either steam or electric driven. They are used principally on drilling rigs for protection against insects. They also are used for cooling and ventilating in industrial plants. They consist of a strong steel fabricated frame and base. Pro-



Lacy Duplex Type Fan

pellers are of the three-blade type made of aluminum. They are made in the 11-foot duplex type, seven-foot duplex type and five-foot single type.

▪ ***Turbolite Steam Trap and Strainer***

Made especially for protecting steam turbine, turbo-generators and other steam operated devices against the entrance of pipe scale, welding fragments and other foreign matter into governor valves, regulators and other internal parts of mechanism. Built in 1, 1½ and 2-inch sizes.

Walter Ruska & Company, Inc.

▪ ***Scientific Instruments***

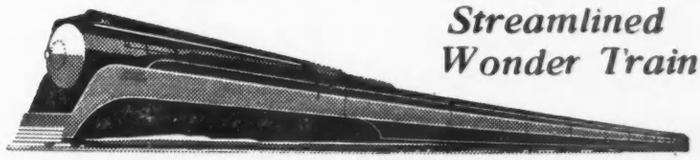
Walter Ruska & Company, Inc., Houston, is showing various scientific instruments for geophysical and petroleum engineering work in Booth 216.

Among the new products the company is showing are moving coil gal-

NEW
FAST
DIFFERENT

Sunbeam

Streamlined Wonder Train



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NORTHBOUND
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Ar. Dallas - - - - - - - - - 8:45 P.M.
Connections at Dallas for Oklahoma, Kansas City, Colorado, Fort Worth and West Texas

SOUTHBOUND
Lv. Dallas - - - - - - - - - 4:15 P.M.
Ar. Houston - - - - - - - - - 9:00 P.M.
Connections at Houston for Beaumont, Lake Charles, New Orleans, East, Rio Grande Valley, San Antonio, El Paso, West

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Good in Chair Cars Houston to Dallas or Dallas to Houston

Luxurious Chair Cars, Parlor Car, Diner-Observation-Lounge; Radio. A solid unit of comfort and service—a real train that makes travel a pleasure. **Automatic Electric Block System**—insuring safety. **Heavy steel rails**—smooth, comfortable.

Advance reservations must be made for Parlor Car Seats

3 Other Daily Trains Between Houston-Dallas: **"Hustler," "Central Express," "Owl"**

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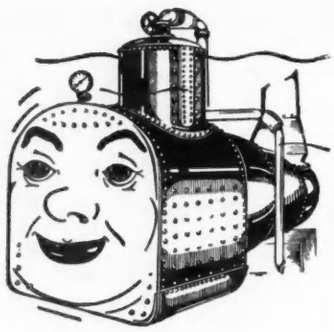
Southern Pacific

J. T. MONROE, PASSENGER TRAFFIC MANAGER, HOUSTON, TEXAS

"YOU SHOULD HAVE HEARD WHAT THE BOILER INSPECTOR SAID!"



"On his last inspection the Boiler Inspector said that I was entirely free of scale and I was in the best condition he had ever found me!

"He smiled with understanding when I told him that for the last two years I had been using SAND-BANUM—The Entirely Different Boiler and Engine Treatment—because he, too, knows that it is a pure colloidal concentrate that comes ready for use in 16-ounce cans. And that a few ounces from one to four times per month holds all water impurities in suspension and thus prevents scale and corrosion, shutdowns and tube replacements, priming and foaming and loss of efficiency.

"Sand-Banum is absolutely safe to me, and the men applying it. It is the HAPPY WAY of making boilers happy. And, of course, it is guaranteed—it is always sold to The Boss on a 'Satisfaction or No Money' guarantee. Why don't you drop them a line and get their practical booklet 'HOW and WHY?' My Boss did!"

SAND BANUM

NOTE: The above is the substance of an actual letter received recently. We shall be happy to mail a copy upon request.

HOUSTON OCTOBER 11-16-1937 SEE OUR EXHIBIT OIL WORLD EXPOSITION

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AMERICAN SAND-BANUM CO., Inc.

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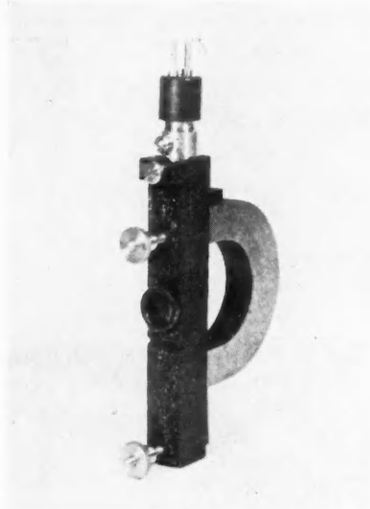

Ruska Single-Unit Galvanometer

vanometers and other instruments for seismograph prospecting. The new galvanometer is made of single or multiple unit design with exchangeable coil suspensions. The total width of the galvanometer is only ½ inch, so that 12 traces can be projected easily on a 6-inch film. Both leads on the galvanometer are insulated; no ground is used.

The petroleum engineering instruments shown by the company are instruments for determining the porosity and permeability of sand cores, a volumetric mercury pump, and other high pressure equipment. The new mercury pump is a screw feed plunger pump of high accuracy calibrated to measure volume displacements with an accuracy of .01 cc. at pressures up to 7000 pounds per square inch.

The company also is showing various other scientific and optical instruments for the oil industry which are distributed by them. On display are the latest Bausch & Lomb binocular microscope with attachments for paleontological work.

Californians to meet at Houston Show

With a larger number of exhibitors than from any other state except Texas, California's representation at the Oil-World Exposition will be a big factor in the dissemination of data on field and plant operation at the Houston Show being held from October 11 to 16, inclusive. The California Association has therefore been organized with John R. Suman of Humble Oil & Refining Company chairman and S. T. Childress of Rio Bravo Oil Company vice chairman. Both Suman and Childress are native sons of California.

Many of the men now engaged in the oil business in Texas are originally from California, and these, together with the visitors from that state, will hold a luncheon at the Houston Club at 12:30 noon on Friday, October 15. There will be a registration of all the visitors from California, and these, combined with the men representing the California manufacturers, will make an outstanding group at the show.

MEN IN THE INDUSTRY'S NEWS

FRANK M. AUSTIN, of Houston Lighting & Power Company, has been named a director of the Oil-World Exposition, Inc. He succeeds J. B. Fleming, resigned.

CHARLES FITZGERALD, assistant to the vice presidents and in charge of Texas operations of Sinclair Refining Company, Pipe Line Division, accompanied by his wife, is vacationing in California. They will return to their Fort Worth home about mid-October.

J. EDGAR PEW, vice president in charge of production for Sun Oil Company, Philadelphia, and H. A. W. Myrin, land department official, visited the Dallas office of the company early last week. They will also visit Gulf Coast areas, and test their deep sea fishing ability near Sabine Pass.

D. JOHN MUNROE, district geologist for Sun Oil Company in Mississippi, with headquarters at Hattiesburg, visited the company's Dallas office early last week.

MARSHALL AINGELL, formerly with Shell Petroleum Corporation at Kilgore, has succeeded Robert T. Lutz as scout for The Pure Oil Company in Northeast Texas and the Rodessa district, with headquarters at Tyler. Lutz resigned recently to operate as an independent.

H. L. GRILEY, land man for Sun Oil Company, Tulsa, has been transferred to Mattoon, Illinois, to establish a new district office. The company plans to acquire leases in the new Illinois producing areas, and along wildcat trends. Finley Doyle, geologist, and W. J. Hardy, land man, will be moved from Dallas and San Antonio, respectively, to Mattoon.

A. M. EBRIGHT, engaged in general practice at Wichita, Kansas, for the past several years, will become chief counsel for Cities Service Oil Company and Cities Service Gas Company as of October 16. He replaces J. W. Finley, who resigned June 1.

TOM BROWNFIELD, chief scout for Carter Oil Company, Tulsa, spoke on "The Petroleum Industry" before a meeting of oil classes in the Tulsa Public Night School course. Brownfield outlined the development of oil fields in the Mid-Continent region, giving the significance of each pool in the region.

ALEX HIGGINS has resigned as head of the mining and mechanical engineering department of the Institute of Technology and Art, Calgary, to engage in private practice as a consulting engineer and geologist with offices in Calgary, Alberta.

JOE WILSON, former assistant proration superintendent of Stanolind Oil & Gas Company, has signed a three-year contract with Columbia Petroleum Company and will serve as the company's geologist at Cucuta, Colombia, South America.

KENNETH L. GOW, geologist for Superior Oil Company of California with headquarters at Mattoon, Illinois, discussed "Illinois as an Oil Producing State" before the Greenup Lions Club last week.

R. B. ROAPER, safety engineer for Humble Oil & Refining Company, Houston, has been elected chairman of a new organization known as the Texas Safety Executives Association, which is to promote safety work in the state. Cecil L. Hightower, safety director of United Gas Systems, was elected vice chairman, and Norman H. Beard, public relations director of the Houston Chamber of Commerce, was made secretary.

Charter members in addition to the foregoing men are the following: R. J. Hutchison, safety engineer, Shell Petroleum Corporation; Rolla H. Hord, safety engineer, Shell Petroleum Corporation;

C. B. ROAPER

R. G. Naul, safety director, Hughes Tool Company; J. J. Delahide, safety engineer, E. D. Bullard & Company; Lee Connor, safety engineer, The Texas Company; Hadley B. Cammack, superintendent of traffic, Houston Electric Company; H. L. Rankin, secretary-treasurer of Gulf Casualty Company; Herbert G. Turner, tax insurance department, United Gas Corporation; Charles W. McPhail, general claims and insurance agent, Houston Lighting & Power Company; Thomas E. Gibons, manager engineering and inspection department, Southern Underwriters; C. J. Cohlin, personnel department, The Texas Company; and Harry M. Jones, refinery department, Shell Petroleum Corporation.

The plan of the organization will permit the exchange of ideas of technically trained safety men, so that their views and experience can be consolidated.

MICHAEL J. LEAHY, consulting engineer and industrial chemist, has established an office in the Insurance Building, Fort Worth. He is specializing in the production, refining and natural gasoline phases of the petroleum industry.

JOHN MILLER, The Texas Company, Houston, was elected president of the Houston Geological Society at its weekly meeting last week. Other officers elected at that time were, Perry Olcott, Humble Oil & Refining Company, vice president, and Lon D. Vartwright, Skelly Oil Company, secretary-treasurer.

H. V. FOSTER, formerly president of Indian Territory Illuminating Oil Company, Bartlesville, Oklahoma, and now head of his own companies, is seriously ill at his home in Bartlesville.

PAUL H. PRICE, Morgantown, West Virginia state geologist, is in charge of a tour to be made this week by approximately 100 members of the American Association of Petroleum Geologists preliminary to the Mid-Year Meeting of the organization which opens in Pittsburgh, October 14. Sections of West Virginia, Virginia and Pennsylvania will be visited.

ALFRED HURLBURT of Republic National Gas Company of Corpus Christi has been named a member of the nominating committee of the Independent Petroleum Association of America.

CHARLES H. SNELSON, for several years with Skelly Oil Company and head of the company's production office in Houston, has resigned to join Seaboard Oil Corporation. Snelson will be stationed at Corpus Christi where he will be head of the firm's production office in that district.

E. A. GRAHAM, Corpus Christi drilling contractor, is moving back to San Antonio, but will retain his office in Corpus Christi.

J. BARNEY WHISENANT and Jack Trenchard have opened an office at 1403 Charleston Street, Matoon, Illinois. Whisenant is in San Antonio for a brief stay after which he will return to head the Illinois office.

JAKE HAMON is commuting between Dallas and San Antonio.

E. D. LUMAN, chief geological scout for Atlantic Refining Company; E. H. Blum, vice president and general manager; Jim Mendenhall, head of the land department, and C. F. Sharp, assistant to Mendenhall, who office in Dallas, were San Antonio visitors.

CHARLES SPRATLING, former accountant with Al Buchanan Drilling Company, San Antonio, and one of the organizers of the Petroleum Accountants Society, has joined Lybrand, Ross Brothers & Montgomery, accountants and auditors of Houston.

HERBERT R. DAVIS, consulting engineer with 30 years experience in natural gas activities, has been named to the directorate of Wyoga Gas & Oil Corporation of Williamsport, Pennsylvania, to represent Buffalo, New York, interests. In addition to owning gas properties in New York and Pennsylvania fields, the company has recently undertaken repressur-

ing of an oil property near Oil City, Pennsylvania.

J. P. COLLINS, R. G. Ironside, E. Kenny, E. C. MacDonald and F. A. Dowler were named directors of Ranchmen's Oil Company, Ltd., organized to take over the assets of Ranchmen's Gas & Oil Company, Ltd., Alberta producing company, when shareholders of the company held a special meeting in Calgary last week.

C. C. HOGG, production superintendent for National Petroleum Company, Pleasantville, Pennsylvania, discussed "Repressuring and Pumping of Oil in the Pleasantville-Tellersville Area," and C. B. McClintock, consulting engineer of Oil City, talked on "Geological Phases of Repressuring" before the Petroleum Session of the American Society of Mechanical Engineers which met in Erie, Pennsylvania, last week. John Reid, president of Joseph Reid Gas Engine Company, presided at the session.

JACK DANCIGER, vice president of Danciger Oil & Refineries, Inc., returned to headquarters last week after spending the past four months in California recuperating from a serious illness.

C. H. WHITMAN has been named manager of a newly created crude oil purchasing and storage division of the producing department of Standard Oil Company of Louisiana, M. J. Rathbone, president of the company, announced last week. J. R. McWilliams is head of the producing department. Whitman joined the company at Baton Rouge in 1915, and since 1931 had been with Standard Oil Company of New Jersey.

J. S. JOHNSON, who has been in Houston for some time, has opened a machine shop in Luling, firm name being Johnson Tool Company. In addition to operating a complete machine shop and doing all kinds of welding, Johnson will manufacture oil field tools and high-pressure pumps.

G. C. RIVES, formerly assistant superintendent of Standard Pipe Line Company in the Rodessa field, has been promoted to superintendent, succeeding S. A. Sheppard, who was transferred to South Louisiana where a new district has been created. Rives will have headquarters at Trees City, and will be in charge of lines in Caddo and Sabine Parishes, Louisiana, Miller County, Arkansas, and Cass County, Texas.

H. N. SEEVERS, geologist for Atlantic Refining Company, Corpus Christi, for a number of years, is resigning October 15 to go with Shasta Oil Company, to be in charge of Shasta's operations in South Texas.

A. E. GETZENDANER, zone geologist for Gulf Oil Corporation, Corpus Christi, left by plane for a two-week trip to Pittsburgh. He will attend the American Association of Petroleum Geologists meeting, October 14 to 16, while in the eastern city.

F. A. CHILES has been transferred from the Corpus Christi offices of Seaboard Oil Corporation to Dallas.

PORTER REGENOLD, Corpus Christi map maker, has just completed a map on Zapata County. It is one of the few maps ever built on that area and is probably the most up-to-date. The map is drawn on a scale of 1 inch to 4000 feet. It contains the most complete available information on leases, ownerships and development.

G. I. McBRIDE, engineer for Happy Belting Company, Tulsa, was guest speaker at a meeting of the Engineers Club of Tulsa October 4. He spoke on drilling barges now used along the Gulf Coast and designed by himself while working for The Texas Company.

R. L. IRVING, president of Lightner Torpedo Company, told members of the Oklahoma City Geological Society of troubles encountered by well-shooters at a meeting October 4.

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(see opposite page)
Distributed throughout the Mid-Continent and Gulf Coast by
BRIDGEPORT
For prompt out-of-stock or carload deliveries of National Tube Pipe of all kinds, phone the nearest Bridgeport representative—station to station.
THE BRIDGEPORT MACHINE COMPANY
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EDMOND O. MARKHAM, assistant chief geologist for Carter Oil Company, Tulsa, and Miss Kathryn Wade, were married at Tulsa October 2. Mr. and Mrs. Markham are on a motor trip through Tennessee and Kentucky.

MALCOLM BERANGER of Paris, European representative of Standard Oil Company of California, returned to his headquarters after a trip to London.

FLOYD OHILGER, general superintendent in Arabia for California-Texas Oil Company, returned to the peninsula recently from England.

T. COHN, formerly of Seaham, England, recently arrived in Trinidad to accept an appointment to the technical staff of Kern River Oilfields of California, Ltd.

DR. C. W. TOMLINSON, Ardmore geologist, was guest speaker at the first of the winter series of meetings for the Tulsa Geological Society October 4. He discussed a field trip made last August through the Big Horn Basin and Yellowstone Valley.

R. B. MITCHELL, with Stanolind Oil & Gas Company, was elected president of the East Texas Geological Society at its first fall meeting at Tyler. Other officers include R. L. Jones, Cities Service Oil Company, vice president, and E. A. Murchison, Humble Oil & Refining Company, secretary and treasurer. C. L. Harold, Shell Petroleum Corporation, presented a paper on the geology of Graham Island, British Columbia, describing several occurrences of bituminous matter.

ED. HANLON, Hanlon-Waters, Incorporated, Tulsa, recently reported from Paris, France, where he is visiting the International Exposition.

R. W. BOND, division manager for Shell Petroleum Corporation at Wichita, Kansas, has been transferred to the company's Tulsa office as production manager, succeeding Ralph Roark who recently was appointed vice president.

JOE WILSON, with Stanolind Oil & Gas Company, Oklahoma City, Oklahoma, will join Colombia Petroleum Company, Cucuta, Colombia, as geologist.

JOHN BUNN, formerly of Ardmore, Oklahoma, recently organized the Cia. Bunn-Mexico, with headquarters in McAllen, Texas. Bunn has been drilling in northern Mexico for several years.

WM. HOLLAND and Ludwig Bal, both with Ohio Oil Company, Casper, Wyoming, recently made a trip to Denver, Colorado, to attend a proration meeting for the Lance Creek field, Wyoming.

K. S. ALBERT, consulting engineer of Casper, Wyoming, recently made a combined business and pleasure trip to southwestern Wyoming and Spokane, Washington.

CHRISTIAN VRANG, geologist with Yellow Stone Oil Company, Casper, Wyoming, and A. W. Harper, business manager of the same company, recently attended a directors meeting of the company in Yanktown, South Dakota.

[*Continued on page 279*]

Markets Better

Stricter production control and continued high demand promote stability.

THE oil industry's markets apparently have become somewhat more stable lately. Probably accounting in large measure for the increased stability is the stricter control of crude oil production that is scheduled for October. Also giving encouragement is the continued relatively great demand for gasoline and other petroleum products.

The opening of the trial of the oil companies at Madison, Wisconsin, evidently has had very little effect on the markets of the industry so far.

However, one factor that seems to be having some effect on the markets for oil is the general weakness of commodity prices in general. In view of the fact that such commodities as cotton, corn, wheat, and other materials lately have been declining in price, it is but natural that prices of petroleum and petroleum products should have some difficulty in maintaining stability. This situation probably explains better than various other conditions why there has been very little talk lately about the possibility of a crude price increase.

Meanwhile, the prices for both crude oil and refined products continue about the same generally as in the past several weeks.

Markets Steadier

The crude oil market has witnessed no further weakening following the reduction of postings some weeks ago in several districts of the country. Furthermore, the crude market apparently has shown some improvement because of the proration program that is in effect this month.

The gasoline market, too, has tended to become more stable in the past couple of weeks. Whereas prices of gasoline at the refineries and also at service stations were trending lower in recent weeks, the prices now appear to be somewhat more steady.

Statistics Show Improvement

The latest available statistics on the petroleum industry, covering the week ended October 2, were somewhat more favorable than the figures for the several preceding weeks. However, there is still one statistical factor that leaves room for improvement. That is the gasoline inventory situation. The gasoline stocks in the United States showed some further decline in that week, but they still are greater than the consumption justifies. The gasoline inventories are less favorably related to the demand for gasoline than were the stocks on hand at this time last year.

Standing at 65,266,000 barrels as of October 2, the gasoline stocks were 13.3 percent greater than the inventories held one year previously. This increase in stocks is greater than the gain that has occurred meanwhile in the consumption of gasoline. So far this year, the gasoline demand has been running only about 10 percent greater than last year.

Gasoline Outlook Better

There is in prospect, however, a correction of the gasoline inventory situation, for the stricter control of crude oil production scheduled for October is causing the refineries to cut down on their runs of crude oil to stills. The smaller refinery output in turn will make is possible for the industry to make during October sizeable withdrawals of gasoline from storage. In several preceding weeks, on the other hand, the withdrawals of gasoline from storage were a little larger than normal for this time of the year, since gasoline output of the refineries was greater than the market justified.

While crude oil production has been lowered, the operations of the refineries also have been reduced this month. In the week ended October 2, crude oil runs to stills declined to 3,400,000 barrels, a decrease of 55,000 barrels from the preceding week. At the new level, the crude runs were only about 13 percent greater than the runs at this time last year.

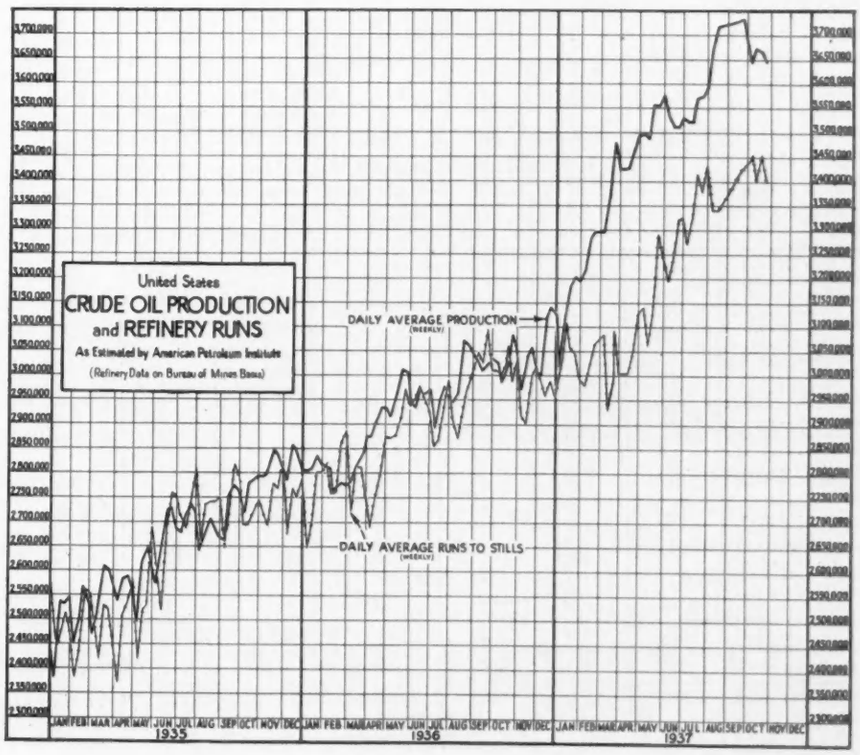
Fuel Market Strong

Meanwhile, the fuel oil market continues especially strong. This continued strength is based largely upon the exceptionally good inventory situation of fuel oils. Production of fuel oils has been stepped up in recent weeks but the supplies still are comparatively small in relation to the heavy demand that prevails. The stocks of fuel oil on hand October 2 were about 4 percent greater than the supplies on hand a year previously. But since this time last year, the demand for fuel oil has risen about 10 percent .

Oil Burner Sales High

The heavy demand for fuel oils this year has resulted, in large part, from the continued increase in the number of oil burners in the United States. There has occurred in recent months some slowing down of the sales of oil burners by manufacturers, but this year's shipments still are running substantially higher than those last year. The Census Bureau last week reported that shipments of distillate oil burners by American manufacturers in August of this year were about 17 percent greater than the shipments in that month last year, and were more than double the number shipped in August, 1935. The August shipments this year totaled 55,017 distillate oil burners.

In the first eight months of 1937, the shipments of distillate oil burners to-



taled 199,216, which was 29 percent more than the shipments in the similar period the previous year. These shipments in the eight months of this year were more than three times as great as the shipments in the similar period of 1935.

Although these figures indicate that this year has brought a continuation in the increase of number of oil burner installations, they also indicate that the sales of these burners have slowed down. The growth in sales has been decidedly less sharp this year than was the growth last year.

Fuel Prices Criticized

To some extent, the slowing down in sales of oil burners has been attributed to recent increases in the prices of fuel oils. In that connection, the oil industry has come in for some criticism. The critics have asserted that the industry was not wholly justified in boosting these prices, and that the industry made the increases only because it felt that it could, in view of the relatively short inventories of those oils.

These same critics sounded a warning to the industry that high prices for fuel oils would invite not only competition from coal producers, but also the possible resentment of the public. According to these critics, there is danger that the public may feel it has been led to make the installations of oil burners under the former relatively cheap fuel oil prices, and that the prices have been advanced without due reason following the installation of those burners.

However, the industry may escape further adverse criticism of this kind, in view of the fact that the fuel oil prices now appear to be stabilized at present levels for some time, and in view of the fact that inventories of fuel oils are being expanded.

In regard to the fuel oil situation, the industry is experiencing resistance of consumers to quoted prices, just as some other industries also are experiencing such similar resistance.

Further proof that the oil industry is not immune to consumer resistance is the scene in the asphalt market at present. Some of the asphalt building material manufacturers lately have reduced the prices of their products. These reductions naturally have a depressing effect on the asphalt turned out by the oil companies.

CRUDE OIL PRICES

Complete tables of prices paid for crude oil at the well in principal fields is shown on page 46 of the issue of October 4. This schedule will appear only in the first issue of each month.

Mid-Continent Prices

Tank car prices at Mid-Continent refineries late last week were largely the same as for the preceding several weeks.

U. S. motor gasoline continued to range in the Oklahoma market about as follows: 62 octane and below, 4⅞ to 5 cents a gallon; 63 to 66 octane, 5⅜ to 5½ cents; 67 to 69 octane, 5⅝ to 5⅞ cents; and 70 to 72 octane, 6 to 6⅛ cents.

Prices in the Chicago market ranged as follows: 62 octane and below, 4⅝ to 5 cents; 63 to 67 octane, 5⅛ to 5⅜ cents; and 68 to 70 octane, 5⅝ to 6 cents.

At East Texas refineries the most common product, 60-62, 400 end point gasoline, was priced commonly at 5 cents a gallon.

Kerosene prices f.o.b. Oklahoma refineries ranged from 4 to 4¼ cents a gallon for the 41-43 water white grade, and from 4¼ to 4⅜ cents for the 42-44 water white grade. Corresponding prices in the Chicago market were: 4 to 4¼ cents and 4⅛ to 4⅜ cents.

Trends of United States Production and Stocks

Figures are from American Petroleum Institute weekly reports, except those on crude stocks, which are from Bureau of Mines weekly reports.

WEEK ENDED	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	Gas & Fuel Oil Stocks (Barrels)
January 2, 1937	3,121,400	3,030,000	287,659,000	62,661,000	106,330,000
January 30	3,194,050	2,995,000	285,384,000	69,540,000	102,078,000
February 27	3,296,100	3,085,000	288,121,000	78,786,000	99,534,000
March 27	3,431,300	3,060,000	293,587,000	*83,538,000	96,591,000
April 24	3,496,400	3,125,000	300,737,000	82,303,000	94,100,000
May 29	3,573,000	3,245,000	306,445,000	78,758,000	96,139,000
June 26	3,529,600	3,235,000	307,679,000	75,427,000	100,395,000
July 31	3,591,900	3,425,000	308,250,000	70,872,000	108,209,000
August 28	*3,731,450	3,425,000	309,506,000	66,997,000	112,111,000
September 25, 1937	3,666,300	*3,455,000	307,974,000	65,620,000	116,472,000
October 2, 1937	3,647,450	3,400,000	.....	65,266,000	117,076,000
October 3, 1936	2,987,800	3,000,000	294,349,000	57,610,000	112,712,000
Change in past year	+ 22%	+ 13.3%	+ 4.5%	+ 13.3%	+ 3.9%

* All time peak.

Summary of Wells Completed in the United States Week Ending October 9, 1937

	Completions	Oil Wells	Gas Wells	Failures	Initial Production	Total 1937	Total this Date 1936
Alabama	....	....	....	....	.....	1	2
Arkansas	4	3	....	1	5,140	92	74
California	35	30	....	5	17,370	1,176	879
Colorado	....	....	....	....	.....	15	12
Florida	....	....	....	....	.....	1	1
Illinois	18	10	....	8	1,683	211	4
Indiana	15	4	3	8	45	105	161
Kansas	61	47	2	12	72,494	2,076	1,297
Kentucky	21	12	1	8	355	337	229
Louisiana	25	15	6	4	5,348	759	805
Michigan	19	10	1	8	1,690	740	610
Mississippi	....	....	....	....	.....	11	6
Montana	4	3	1	....	6,136	155	134
Nebraska	....	....	....	....	.....	....	.....
New Mexico	16	13	1	2	9,897	557	448
New York	3	....	2	1	.....	17	.....
Ohio	32	12	13	7	255	1,134	1,507
Oklahoma	37	27	2	8	12,385	2,372	2,278
Pennsylvania	11	2	5	4	7	162	.....
Texas	303	231	11	61	506,091	11,872	9,760
Utah	....	....	....	....	.....	....	.....
West Virginia	14	3	9	2	18	714	520
Wyoming	6	2	2	2	202	86	67
Total this week	624	424	59	141	639,116	22,633	18,794
Total last week	659	463	47	149	617,782	....	.....
Total this year	22,633	15,717	1,896	5,020	19,019,032	....	.....

Pure Oil Company building Illinois line

Plans for construction of a 45-mile pipe line to run from a point 1 mile east of Noble, Richland County, Illinois, to The Pure Oil Company's tank farm at Martinsville, Clark County, at a cost of $600,000, have been approved by the Illinois Commerce Commission. Ap-

Comparison of Permits Granted for New Wells

STATE	Week Ending Oct. 9	Total this Mo.	Total this Year	Total this Date Last Year	1936 Year Total
Arkansas	4	8	194	79	103
California	30	57	1,220	823	1,054
Louisiana	23	58	997	886	1,107
Kansas	53	119	2,178	1,368	1,873
Michigan	26	44	773	576	762
Oklahoma	44	93	2,235	2,235	2,594
Texas	494	808	11,927	11,850	15,582
Total	674	1,187	21,778	17,817	23,075

We extend an

INTERNATIONAL WELCOME

as Broad as Texas

PAMPA

DALLAS

KILGORE
TURNERTOWN
WILLOW SPRINGS

KERMIT
WINK
ODESSA

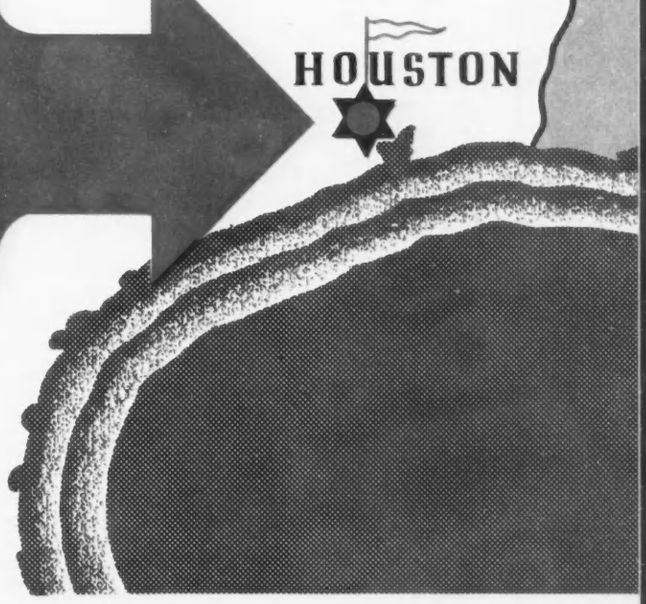
to

HOUSTON

INDEPENDENT PETROLEUM ASSOCIATION
Houston, Oct. 14-15-16

INTERSTATE OIL COMPACT COMMISSION
Houston, Oct. 14-15

OIL-WORLD EXPOSITION
Houston, Oct. 11-16



For nearly 20 years—beginning at Panhandle, Borger and Pampa,—International Supply Company has been privileged to welcome and serve the oil men in every important oil field development in the great Lone Star State.

At this season of important events in Houston, the International Supply Company renews its welcome, not only to the oil men of Texas and the great Mid-Continent area, but to the oil men of the world who will assemble at Houston to attend and participate in the meetings, demonstrations, discussions and festivities of the season, and offers its services and facilities to the great Oil Fraternity.

OKLAHOMA
Tulsa
Seminole
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Oklahoma City
Wewoka
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KANSAS
Chase
Hays
Great Bend
Hutchinson
*Wichita

TEXAS
Kilgore
Turnertown
Odessa
*Wink
Willow Springs
Kermit
Pampa
Houston
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NEW MEXICO
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INTERNATIONAL SUPPLY CO.

▶▶▶ TULSA, OKLAHOMA ◀◀◀

proval was given Wabash Pipe Line Company, a Pure Oil Company subsidiary, and the company was given authority to enter into a contract with Illinois Pipe Line Company providing for the mutual transportation of crude oil through the lines of both companies. Illinois Pipe Line Company is now operating a line from Wood River through Martinsville and across the states of Illinois, Indiana and Ohio to the Pennsylvania-Ohio state line. Wabash Pipe Line Company plans to transport oil to Martinsville, and there turn it over to Illinois Pipe Line Company for relay.

Output Is Down

Closer adherence to state proration schedules brings output close to Bureau recommendation

DEFLECTING stricter allowables for the principal producing states, United States crude oil production decreased further in the first full week of this month, ended October 9, averaging 3,584,925 barrels a day, which was 55,125 barrels a day less than in the previous week and 16,825 barrels daily more than the Bureau of Mines recommendation for average daily production in October.

Due to the stricter allowables which have been prescribed for the leading producing states, it can be expected that the production throughout October will be more in accordance with the actual demand and will be considerably closer to the Bureau of Mines recommendation, although actual production for the past week in several states was still higher than the Bureau's estimate.

The comparatively sharp drop in production resulted from declines in Texas, Louisiana, New Mexico and Kansas, which greatly outweighed increases in Oklahoma and California.

Texas last week averaged 1,454,500 barrels daily, or 46,500 barrels a day less than in the previous week, and 24,200 a day more than the Bureau of Mines estimate of demand.

Louisiana output was down 11,975 barrels at 251,575 daily, which was 3025 barrels a day less than the Bureau of Mines recommendation.

New Mexico likewise showed a decrease of 10,200 barrels daily, averaging 104,200 barrels a day, which was 2200 barrels a day less than the indicated demand.

California last week averaged 698,900 barrels daily, 10,900 a day more than in the previous week and 38,900 more than the Bureau of Mines estimate.

Oklahoma production was up 4875 barrels, averaging 586,050 barrels daily, or 43,150 less than the estimated demand.

Kansas showed a slight decrease in production, averaging 180,200 barrels a day, which was 4300 barrels more than in the previous week, and 19,700 barrels daily less than the Bureau of Mines recommendation.

United States Crude Oil Production

Estimates Compiled by The OIL WEEKLY

	Bureau of Mines Recommendation (Daily in Oct.)	ACTUAL PRODUCTION BARRELS DAILY FOR WEEK ENDING	
		October 9	October 2
TEXAS—			
Texas Panhandle	.....	74,300	81,700
North Texas	.....	72,200	74,600
West Central Texas	.....	32,800	33,500
West Texas	.....	214,700	224,800
East Central Texas	.....	115,100	116,600
East Texas Field	.....	480,300	478,800
South Texas	.....	260,400	271,700
Texas Gulf Coast	.....	204,700	219,300
Total Texas	1,430,300	1,454,500	1,501,000
OKLAHOMA—			
Oklahoma City	.....	150,575	141,750
Seminole Area	.....	114,375	113,975
Crescent	.....	7,625	7,850
Lucien	.....	13,875	14,650
Fitts	.....	70,225	74,325
Edmund	.....	15,500	15,450
Moore	.....	9,850	9,675
Others	.....	204,025	203,500
Total Oklahoma	629,200	586,050	581,175
KANSAS—			
Ritz-Canton	.....	4,850	4,900
Chase	.....	6,175	7,350
Hollow-Nikkel	.....	2,625	2,575
Sedgwick	.....	3,775	3,825
Burrton	.....	14,200	14,025
Lorraine	.....	3,625	4,075
Russel County	.....	34,250	36,100
Silica	.....	13,225	15,350
Others	.....	97,475	96,300
Total Kansas	199,900	180,200	184,500
LOUISIANA—			
North Louisiana	.....	76,775	88,150
South Louisiana	.....	174,800	175,400
Total Louisiana	254,600	251,575	263,550
ARKANSAS	36,000	40,600	35,125
CALIFORNIA—			
Long Beach	.....	58,600	59,500
Santa Fe Springs	.....	41,300	42,000
Huntington Beach	.....	38,200	36,500
Dominguez	.....	29,400	29,000
Inglewood	.....	17,200	15,000
Ventura Avenue	.....	35,100	35,000
Seal Beach	.....	9,600	9,500
Midway-Sunset	.....	76,000	77,000
Elwood	.....	8,000	8,000
Kettleman Hills	.....	81,300	81,500
Mountain View	.....	17,300	18,000
Playa del Rey	.....	7,800	8,000
Wilmington	.....	60,700	60,000
Others	.....	218,400	209,000
Total California	660,000	698,900	688,000
MOUNTAIN STATES—			
Wyoming	57,300	57,500	57,600
Montana	17,600	18,300	18,300
Colorado	4,500	4,600	4,600
Total Rocky Mountain States	79,400	80,400	80,500
NEW MEXICO	106,400	104,200	114,400
EASTERN STATES	128,800	143,800	138,200
MICHIGAN	43,500	54,700	53,600
Total United States	3,568,100	3,584,925	3,640,050

Michigan oil and gas taxes reach new peak

The Michigan state production (severance) tax on oil and gas for the month of August totaled $45,728, largest levy ever collected in Michigan. The tax is prorated 40 percent to state and townships and 20 percent to counties.

The August levy was on the basis of 1,793,846 barrels of oil valued at $2,231,136 and 379,666,876 cubic feet of gas valued at $55,296.

On the basis of the state's crude oil production figures, August stands as the record all-time high for oil production in the state, about 60,000 barrels over the previous peak set in October, 1935.

Gladwin County with 836,657 barrels of oil valued at $1,054,000 was the biggest in the state.

Industry Remains in Strong Position

Current operations at wells and refineries are in line with market requirements, and inventories are satisfactory... October is bringing even better results than those of September which were good.

By L. J. LOGAN, Associate Editor

DESPITE the recent slowing-down of business in general and the present uncertain prospects for industry and commerce, the petroleum industry remains in a decidedly favorable situation and continues to face a promising immediate future.

The long-term future of the industry undoubtedly will be shaped to a great extent by the general economic forces, eventually turning up or down with the basic trend. And at this juncture the future of the general trend obviously is highly problematical. Warnings having been given that a serious recession may be under way. But some of the most highly respected opinions are that the present faltering of business is only temporary and that the basic upward movement of industry and trade will continue for at least 2 or 3 more years. In view of the uncertainty regarding general conditions, the long-range outlook for the oil industry, too, is necessarily highly conjectural.

Industry Faring Well

But in the meantime, the industry is making the most of present opportunities, and also is maintaining a situation that would be a bulwark against the slings and arrows of any important business recession that might develop.

The industry continues to do record volumes of business at satisfactory prices, consequently showing good earnings; and it continues to restrain operations at wells and refineries in close conformity with market requirements, thereby doing much toward assuring an extension of profitable operations.

Oil Shares in Favor

These conditions explain why the industry continues in the good graces of its severest critics, the buyers and sellers of oil company securities. The oil shares have not escaped the downward pressure on the markets for securities in the past several months, but in the general decline they have given a creditable performance, showing better than average strength and power of resistance. The investors and traders apparently have taken the view that the oil companies are in position to maintain relatively good earnings for an extended period, at least in comparison with companies in other industries, whether the future is to bring prosperity or less favorable business conditions.

Favorable Conditions Prevail

This view that the financial markets are reflecting appears to be well justified by the situation in the oil industry.

This month is bringing unusually favorable conditions, because of the exceptionally strict control of crude oil production that prevails under the October allowables of the leading producing states. The output of the wells is in close conformity with market demand, and it is indicated that some crude oil probably will be withdrawn from storage during the month, whereas some earlier months this year brought substantial additions to crude storage.

Refinery Runs Moderate

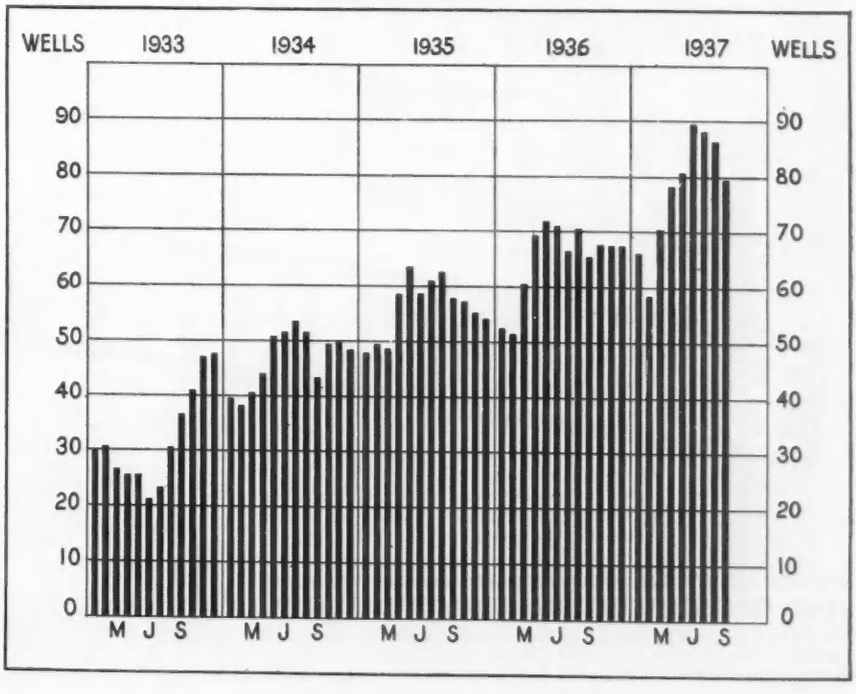
The strict control of crude production is resulting in more economic refinery operations, and consequently the markets for refined products are being affected favorably.

At the beginning of October, crude runs to stills were running about 13 percent higher than at the corresponding time last year, showing an increase that was largely justified, as the demand for all oils this year has been about 11.3 percent greater than last year.

Inventory Position Strong

While the present restraint at wells and refineries is protecting the inven-

Average Number of Wells Completed Daily
(By Months, 1933-1937)



Drilling and Production in September, 1937, and in First 9 Months of 1937 and 1936

STATE OR DISTRICT	*SEPTEMBER, 1937, COMPLETIONS AND CRUDE OIL PRODUCTION						COMPLETIONS AND PRODUCTION IN FIRST 9 MONTHS, 1937 AND 1936								
							WELLS COMPLETED			DETAILS OF 1937 COMPLETIONS				BARRELS PRODUCTION		
	Total Wells	Oil	Gas	Dry	Initial Production	Production for Sept.	1937: 9 Mo.	1936: 9 Mo.	Percent Change	Oil	Gas	Dry	Initial Production	1937: 9 Mo.	1936: 9 Mo.	Percent Change
Arkansas	18	14	...	4	8,808	1,116,750	87	72	+ 21	40	2	45	16,536	7,971,900	8,099,500	— 1
California	103	86	1	16	64,685	20,599,000	1,103	848	+ 30	860	13	230	451,470	173,705,500	161,182,150	+ 8
Colorado	3	2	...	1	146	137,650	11	10	+ 10	3	1	7	2,546	1,174,350	1,253,907	— 6
Eastern States	362	135	132	95	19,531	4,196,850	2,514	2,211	+ 14	804	1,074	636	53,744	32,902,400	29,494,700	+ 11
Kansas	223	159	13	51	209,039	5,730,650	1,955	1,229	+ 59	1,420	90	445	1,811,960	51,792,450	41,510,550	+ 25
Louisiana	108	67	20	21	36,450	7,850,650	717	745	— 4	458	74	185	219,835	68,787,500	58,864,050	+ 17
North Louisiana	72	43	20	9	25,899	2,645,400	358	427	— 16	233	62	63	103,791	21,743,300	19,534,450	+ 11
South Louisiana	36	24	...	12	10,551	5,205,250	359	318	+ 13	225	12	122	116,044	47,044,200	39,329,600	+ 20
Michigan	98	65	1	32	26,442	1,573,900	702	581	+ 21	450	57	195	208,637	11,257,650	9,400,050	+ 20
Montana	22	14	1	7	1,099	545,300	146	128	+ 14	109	13	24	8,951	4,558,950	4,098,300	+ 11
New Mexico	47	40	6	1	21,568	3,434,900	520	424	+ 23	472	23	25	672,716	29,350,450	18,834,350	+ 56
Oklahoma	172	120	9	43	43,332	18,162,700	2,283	2,184	+ 5	1,619	100	564	1,788,454	171,394,500	147,856,200	+ 16
Southeastern States	1	...	...	1	.....	.....	14	9	+ 56	.....	.....	14	.....	.....	.....	....
Alabama	...	...	...	...	.....	.....	1	2	— 50	.....	.....	1	.....	.....	.....	....
Florida	...	...	...	...	.....	.....	1	1	...	.....	.....	1	.....	.....	.....	....
Mississippi	1	...	...	1	.....	.....	11	6	+ 83	.....	.....	11	.....	.....	.....	....
Texas	1,222	975	24	223	1,677,943	44,777,250	11,214	9,266	+ 21	8,532	336	2,346	12,587,128	382,469,200	309,091,800	+ 24
East Texas Field	235	229	...	6	1,195,527	14,307,300	1,740	2,079	— 16	1,679	2	59	8,051,249	126,065,650	119,680,700	+ 5
Rest of East Texas	77	66	...	11	36,606	3,550,250	787	346	+127	677	29	81	423,609	32,201,050	14,549,150	+121
North Texas	149	83	1	65	20,144	2,219,350	1,761	1,615	+ 9	938	21	802	178,877	19,360,350	16,123,550	+ 20
South Texas	291	205	6	80	82,242	8,047,000	2,749	2,431	+ 13	1,922	91	736	771,932	63,554,050	21,687,400	+193
Texas Gulf Coast	130	109	3	18	49,782	6,540,900	1,150	865	+ 33	867	51	232	358,448	55,491,200	65,834,350	— 16
Texas Panhandle	71	58	12	1	28,275	2,371,650	562	489	+ 15	431	112	19	214,655	21,089,800	16,750,250	+ 26
West Texas	238	209	...	29	264,375	6,733,350	2,145	1,093	+ 97	1,883	9	253	2,578,528	55,674,250	47,455,400	+ 17
West Central Texas	31	16	2	13	992	1,007,450	320	348	— 8	135	21	164	9,830	9,032,850	7,011,000	+ 26
Wyoming	7	5	...	2	2,269	1,741,150	79	62	+ 27	49	6	24	34,847	14,476,000	10,113,400	+ 43
Total United States	2,386	1,682	207	497	2,111,312	109,866,750	21,345	17,769	+20.1	14,816	1,789	4,740	17,856,824	949,840,850	799,798,957	+ 18.7

* September completions cover not the calendar month, but the four weeks, or 28 days, ended September 25.

tory position that the industry occupies, this position is remarkably strong, having been achieved through several years of curtailment efforts.

Despite some substantial additions to crude oil storage in earlier months this year and the failure of gasoline storage to decline normally in recent weeks, the inventories of the industry are in more favorable relation to demand than were the supplies on hand a year ago.

As of August 1, latest date on which Bureau of Mines figures are available, the total stocks of all oils were only 1.5 percent larger than one year previously; while as stated before, the total demand for petroleum is running this year about 11.3 percent higher than last year.

The supplies on hand August 1 represented only 145 days' supply at the prevailing rates of consumption, whereas those held on the same date last year represented 161 days' supply. Thus in terms of days' supply, the total inventories on August 1 were 10 percent smaller than those held a year previously.

The crude storage situation has

Demand and Inventory Situation

DEMAND

PERIOD	Demand for All Oils (Barrels)	Domestic Gasoline Demand (Barrels)
First 7 mos., 1936	680,857,000	267,599,000
First 7 mos., 1937	757,910,000	294,659,000
Change this year	+77,053,000	+27,060,000
Percent change	+ 11.3	+ 10.1
July, 1936	105,162,000	46,638,000
July, 1937	118,281,000	50,929,000
Change this year	+13,119,000	+ 4,291,000
Percent change	+ 12.5	+ 9.2

STOCKS OF ALL OILS

DATE	Barrels on Hand	Days' Supply
August 1, 1936	545,498,000	161
August 1, 1937	553,424,000	145
Change in Year	+7,926,000	—16
Percent change	+ 1.5	—10

CRUDE OIL STOCKS

DATE	Barrels on Hand
August 28, 1937	309,506,000
September 25, 1937	307,974,000
Change in Period	—1,532,000
September 26, 1936	294,568,000
September 25, 1937	307,974,000
Change in past year	+13,406,000
Percent change in past year	+ 4.5

REFINED OIL STOCKS

DATE	Gasoline (Barrels)	Gas & Fuel (Barrels)
September 4, 1937	67,048,000	113,443,000
October 2, 1937	65,266,000	117,076,000
Change: Sept. 4 to Oct. 2	—1,782,000	+3,633,000
October 3, 1936	57,610,000	112,712,000
October 2, 1937	65,266,000	117,076,000
Change in past year	+7,656,000	+4,364,000
Percent change in past year	+ 13.3	+ 3.9

American Wire Lines
Distributed throughout the Mid-Continent and Gulf Coast by
(see opposite page)
BRIDGEPORT
For prompt delivery on American Wire Lines—out of stock or carloads direct from factory—telephone any Bridgeport Representative, Store or Office—Station to Station.
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We lubricate EACH WIRE TO INSURE LONG LIFE

AMERICAN TIGER BRAND WIRE LINES

ELECTRICAL WIRES AND CABLES

We manufacture a complete line of Electrical Cables for the Oil Fields, some of which are —

Amerclad All-Rubber Cords and Cables —Including Oil Proof and Oil Resisting Types · Rubber Covered Wire · Reliance U R C Weather-proof Wire · Motor Leads · Switchboard Wires · Geophone, Seismograph and Electrical Prospecting Cables.

LUBRICATION at each point of contact in wire lines is of equal importance to that in any complicated machine.* It reduces external wear, prevents corrosion, cuts down internal friction and enables each strand to move freely — all of which results in increased useful life.

Every wire of American Tiger Brand Wire Lines is carefully lubricated. This adds vitally to the flexibility of the line, enabling it to withstand the terrific jerks of starting and stopping.

This lubrication is the result of years of engineering and field experience and is but one of the many different features which make American Tiger Brand Wire Lines a profitable operating investment for you.

American Tiger Brand Wire Lines are available in either Standard (non-preformed) or Excellay (preformed) constructions.

*** Machines? Absolutely, wire lines are machines. They fit perfectly the dictionary definition, "Any combination of mechanism for utilizing or applying power."**

AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York
COLUMBIA STEEL COMPANY
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United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

shown a similar improvement over a year ago, present inventories being only 4.5 percent larger than those held at this time last year, despite the mentioned 12.5 percent gain that has occurred in petroleum consumption.

Some of the refined oils also show improvement of inventory situations similar to the improvement for "all oils" and for crude oil, these products including particularly the fuel oils. The present inventories of gas and fuel oils are only 3.9 percent greater than the supplies on hand a year ago, while in the meantime there has occurred an increase of about 10 percent in the consumption of those oils. This inventory situation has been largely responsible for the strong markets for the burning oils this year.

Gasoline Stocks Too High

A partial exception to the generally favorable inventory situation is the present quantity of gasoline in storage. Largely because of excessive output at refineries in August and September, withdrawals from gasoline storage in that period were below normal for that time of the year, and at present the supplies on hand are 13.3 percent larger than at this time last year. Such an increase in gasoline stocks is not fully justified, as the demand for gasoline has been only about 10 percent larger this year than last year.

September Results Good

Even in September, when control of crude production was strict, but not as strict as that of this month, the existing inventory position was well maintained. Crude oil stocks were reduced approximately 2,000,000 barrels between September 1 and September 25, and for the closing days of the month no further important change in the crude stocks is indicated.

Gasoline inventories were reduced nearly 2,000,000 barrels between September 4 and October 2, coming down to 65,266,000 barrels. Gas and fuel oil inventories in that same period were increased over 3,500,000 barrels, but that gain was seasonal and well justified by prevailing inventories and the current and prospective demand.

Drilling activity continued heavy in September, showing a small decline from August but remaining close to the peak of the year, reached in June. The completions in September averaged 85.2 wells per day, compared with 86.2 daily the previous month and the year's peak of 89.5 daily. The September drilling was the greatest for that month since 1926, when completions averaged 88.6 daily.

In the first 9 months of this year 21,345 wells were completed, or 20.1 percent more than in the similar period last year. The greatest expansion in field work has occurred in Eastern Texas outside the East Texas field, where completions this year have been more than twice as numerous as those last year.

Oil at Conventions

[*Continued from page 66*]

able that corrosion of lines and equipment in the field and at refineries might result. He closed by stating a belief that gas-oil ratios were primary factors in salinity of production.

Effect of Pressure

"The effect of Pressure Upon the Viscosity of Air, Methane and Two Natural Gases," by B. H. Sage and W. N. Lacey, California Institute of Technology (A.I.M.E. technical paper No. 845) was given by S. E. Buckley. Flow equilibra of two immiscible liquids in unconsolidated sands by E. N. Dunlap, was given by George Cannon of Houston to close the afternoon session.

All presentations were followed by general discussions, and papers were well illustrated with slides showing equipment and graphs. W. B. Heroy, New York, A.I.M.E. director, was introduced to the group.

Flow Through Sands

Friday morning a paper entitled, "Steady and Unsteady Flow of Oil-Gas Mixtures Through Unconsolidated Sand," by L. S. Reid and R. L. Huntington, University of Oklahoma, presented data relative to the flow of heterogenous fluids through porous media, the information being obtained by the joint authors from experiments conducted. The very little factual information available on such flow behavior made predeterminations impossible. In addition, gas saturated sands present specific problems. Characterizing Wyckoff and Botset as pioneers in the work, the speaker detailed his experiments and charted results by using crude from Moore Pool of Cleveland County, Oklahoma, unconsolidated packed sand in tube, and other conditions approximating those found under natural circumstances.

Abnormal Pressures

Paul Weaver, Gulf Oil Corporation, spoke on the "Abnormal Pressures in Reservoirs." His remarks chiefly in reference to Gulf Coast findings, pointed out the extreme pressures encountered in the area. He called attention to mud relationship, and to the exceptional pressures below 7000 feet. Tentative explanation of blowouts of deep wells was the title of an unprogrammed paper by H. C. Spoor. He called attention to high pressures in deeper formations, stressing mud weight as a probable preventive measure.

Three Mud Papers

The morning session was closed with

Lucey
BOILERS
(see opposite page)
Distributed throughout the Mid Continent and Gulf Coast by
BRIDGEPORT
For prompt delivery on Lucey Boilers, from convenient stocks or direct from the factory, telephone the handiest Bridgeport Representative—station to station.
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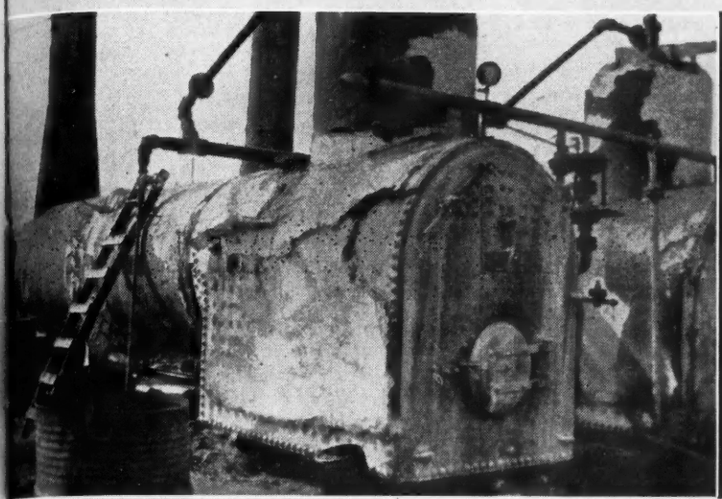
Oil Field Fashion Note

"THIS WINTER BOILERS WILL WEAR *LUCEY OVERCOATS*".*



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Patented

*Steel Jacketed Boiler Insulation.

Inner View of Section Showing Wool Insulation and Wire Netting.

PAYS FOR ITSELF IN ONE YEAR THROUGH SAVINGS

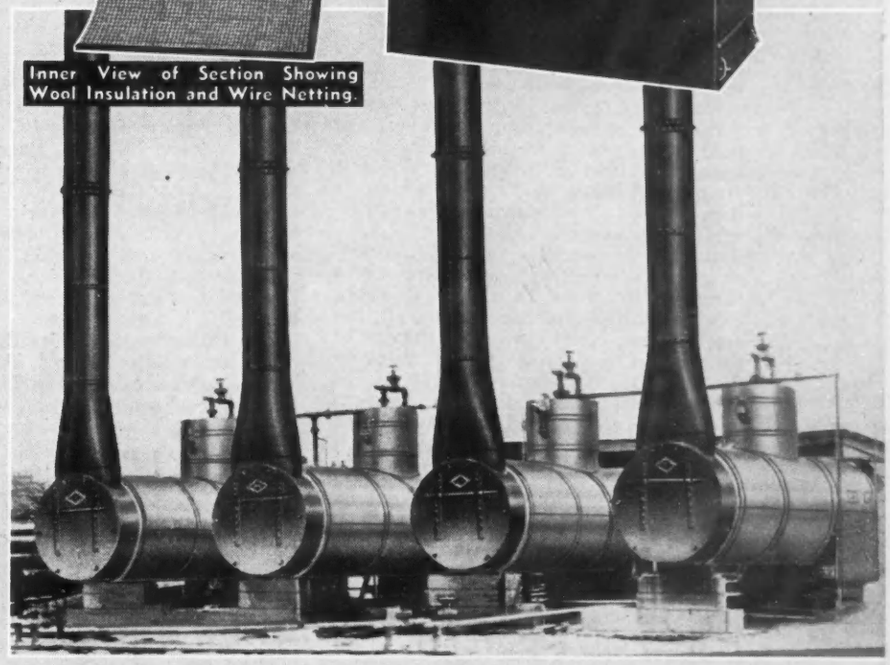
10% greater Boiler Efficiency. 10% or more saving in fuel bills. 33% less Pressure Drop—Steadier Steaming. Effect of Weather Conditions Negligible. Low Maintenance—Reduces Scale—Removable—Waterproof.

Lucey Insulation Casing consists of 1/16" thick steel sheet, lined with 2" thick blanket of Eagle-Picher Mineral Wool Insulation, with 3/4" air space next to boiler. The 16 sections are easily installed after boiler is set up; held in place by adjustable steel bands; easily removable for boiler inspection or repairs.

LUCEY 84" Welded Fire Box OIL COUNTRY BOILER

Although the Lucey 84" Rivetless Firebox Boiler contains 1040 sq. ft. of heating surface (100 H.P. A.P.I. Rating), due to advanced design and increased efficiency, it actually delivers 132 H.P. by rigid oil field tests. While 40% is considered normal efficiency for an uninsulated oil field boiler, engineering tests show that Lucey Boilers are 58-60% efficient with a far greater horse-power than its A.P.I. Rating.

Write for Bulletin 141-1 on Insulation; Bulletin 110-2 on Lucey Boilers.



Battery of Boilers with Lucey Steel Jacketed Insulation.

LUCEY

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Chattanooga, Tenn.

three talks on gel formation in mud by Charles E. Reed, Massachusetts Institute of Technology; "Sheer Strength of Muds," by Benjamin C. Craft and Benjamin I. Routh of Louisiana State University, and "Intensive Mud Weighing," by H. E. Gross, University of Oklahoma.

Charles Reed, working with associates, explained the present knowledge of colloidal matter, gels and solutions. Much recent original work was described and many new facts brought to light. Of these, many were explained, but further experimental effort is required to show a number of important relationships. Numerous fallacies were shown to exist, and other surprising data was gathered relative to colloidallity and size, temperature action, and inhibition of mechanical formations of gels.

"Sheer Strength and Associated Data," presented by Craft was related closely to practice. The control of jel solids was pointed out as highly important to use. The effects of temperature on the jels was another item of interest and the mechanical walling was described. Tests made in the field formed the basis for his paper.

Separation of Mixtures

The fourth session, with T. V. Moore as Chairman, was started by G. O. Kimmel and R. L. Huntington, University of Oklahoma, with their paper, "Stage Separation of Crude Oil-Gas Mixtures." Kimmel made the delivery.

"Behavior of Contents of High Pressure Reservoirs," by E. A. Stephenson of University of Kansas, detailed a consideration of mathematical constants present, and factors involved in movement of the fluids.

D. L. Katz, University of Michigan, presented a paper on "The Use of Equilibrium Constants in Production Engineering," an interesting summation of the effects of the removal of crude from a pressured reservoir.

"Calculation of Equilibrium in Hydrocarbon Mixtures" was a presentation by S. E. Buckley, Humble Oil & Refining Company, research engineer. This interesting discussion concerned hydrocarbon equilibria as applied to refining and natural gasoline recovery. The paper described a technique which has been used satisfactorily to calculate directly from hydrocarbon analysis and laboratory data derived from examination of subsurface samples, oil and gas behavior during production. The types of information calculated were the gas-oil ratios through liberation of dissolved gases, composition of gasoline content of liberated gases, composition and gravity of residue gas, volume of gas liberated in flashing to stock tank. And last, the shrinkage of crude to stock tank. Results of tests were correlated and data plotted at three temperatures.

"Desalting of Crude Oil" was the subject of a presentation by Gustave Egloff and E. F. Nelson, Universal Oil Products Company.

The last paper delivered was by S. F. Mauney, Carter Oil Company at Seminole, Oklahoma, on oil treating.

Eastern States geology to feature A. A. P. G. meeting

Technical discussions on the geology of the eastern part of the United States will feature the Mid-Year Meeting of the American Association of Petroleum Geologists to be held here October 14 to 16. The meeting will be the second of the association in the eastern states and the first to be held in the region of the birthplace of the American oil industry.

R. W. Clark, Appalachian district representative of the association, is general chairman. He will be assisted by the following members of the general committee: J. E. Billingsley, Charleston, West Virginia; Jack Gaddess, Port Allegany, Pennsylvania; K. C. Heald, Pittsburgh; D. J. Jones, Lexington, Kentucky; J. G. Montgomery, Oil City, Pennsylvania; John L. Rich, Cincinnati; DeWitt T. Ring, Columbus, Ohio; and J. French Robinson, Pittsburgh.

Pre-convention and post-convention field trips of the Eastern Fields area have been arranged by M. G. Gulley and R. E. Sherrill, both of Pittsburgh, and Paul H. Price, Morgantown, West Virginia.

Technical Program

The following technical program has been arranged by a committee headed by Thurman H. Myers, Pittsburgh:

October 14, Afternoon Session—George H. Ashley, Pennsylvania Geological Survey, "History of Development and the Geological Relationships of the Appalachian Fields"; L. L. Nettleton, Gulf Research Laboratory, "Gravity, Magnetic and Geological Profile Across the Appalachian Mountains," and L. E. Randall, The Geophysical Company, Incorporated, "Seismograph Exploration in the Appalachian District."

October 15, Morning Session—Charles R. Fettke, Carnegie Institute of Technology, "The Oriskany in Pennsylvania"; Robert C. Lafferty, Owens-Libby-Owens, "The Oriskany in West Virginia"; Wilbur H. Stout, Geological Survey of Ohio, "Petroleum Geology of Eastern Ohio," and C. A. Hartnagel, New York State Museum, "The Medina and Trenton of Western New York."

October 16, Morning Session—B. F. Hake, Gulf Oil Corporation, "Geological Occurrence of Oil and Gas in Michigan"; Theron Wasson, Pure Oil Company, "Geological Occurrence of Oil and Gas in Illinois" R. E. Stouder, Louisville Gas & Electric Company, "The Chester Rocks of Meade, Hardin and Breckinridge Counties, Kentucky," and Newall M. Wilder, Lexington, Kentucky, "Repressuring in Eastern Kentucky."

The following comprise the local arrangements committee: J. French Robinson, K. C. Heald, L. G. Huntley and K. F. Treschow.

Game for I.P.A.A. dinner is caught

Various oil and oil supply men left several weeks ago on a hunting trip to Wyoming, which, according to reports, was very successful. Moose, elk, antelope, deer and grizzly bears were the take.

The party included the following men: from Houston, J. U. Teague, Dal Legan, Billy Legan, Ernest Cockrell, George Strake, S. P. Brown, Bob Bridges, Paul Hubbard, John Suman, Richard Suman, Cap McDonald, R. Y. Smith and W. H. Thompson; from Weatherford, Texas, Joe Quante and Chris Quante; from Fort Worth, G. Peeples, Chas. Youngblood, W. J. Gourley and Chas. Medley; from Tyler, Texas, Bill Copeland; from Midland, Texas, W. T. Doherty; from Odessa, Texas, Lon Baker; from Tulsa, Oklahoma, H. A. Hodgson, Fred Cummings and Henry Shaeffer.

Mrs. S. P. Brown, who accompanied Mr. Brown as far as the Valley Ranch near Cody, killed an antelope.

The game will be served at the I.P.A.A. banquet Friday evening in the Rice Hotel, Houston.

East Texas Chapter of A.P.I. holds good meeting

The fall meeting of the East Texas Chapter, American Petroleum Institute, held at Kilgore Tuesday evening, October 5, was featured by a large attendance and a program of unusual interest. Several prominent railroad commission and A. P. I. officials were present and addressed the meeting ahead of the scheduled program.

An informal dinner was given at 6:30 in the Kilgore Hotel for officers and committee members of the local A. P. I. chapter.

Colonel E. O. Thompson, chairman of the Texas Railroad Commission, addressed the meeting and stressed the importance of the petroleum engineer in oil conservation work. He said the commission was dependent largely upon the testimony of the petroleum engineer in its fight to enforce an equitable proration and curtailment program.

Thompson also spoke of the importance of checking encroachment of salt water in the East Texas field through well repair work, and added in subsequent remarks that disposition of the water when produced would be a problem of increasing concern.

Carl Young, secretary of the Production Division, American Petroleum Institute, addressed the meeting and reviewed the activity and progress of the organization.

"Plug Back Work in the East Texas Field," a paper by R. H. Maples, Cities Service Oil Company, and F. J. Mikeska, Gulf Oil Corporation, was well received. It told of the recent rapid encroachment of Woodbine water in the west side of the field and outlined the method of attack through plugging back operations. It is published in full in this issue (page 74).

Olin Culberson, director Utilities Division, Texas Railroad Commission, read an interesting paper on "The Use of Malodorants in Natural Gas." Under a recent Texas law, the odorization of natural gas has become a necessity, where the gas is used in an area or place occupied by human beings.

S. V. Jay, Humble Oil & Refining Company, presented a paper on "Calodorant as a Malodorant in Gases, as a Warning Agent."

Following the paper read by Maples and Mikeska, I. F. Bingham, Universal Atlas Cement Company, gave an interesting talk on the use of slow-setting or "retarded" cement.

Others present who made short talks were: R. D. Risser, chairman of the A. P. I. District Advisory Committee, and Walter H. Meier, national chairman of the District Activities Committee.

Men in the Industry's News

[*Continued from page 266*]

DR. S. H. KNIGHT, head of the geological department of the University of Wyoming, is directing a group of students on a tour through the Big Horn Basin area, Wyoming.

W. S. NOBLE, Houston, is on a business trip to Oklahoma City. His associate, R. S. Baker, returned last week from an extended trip through northern states.

WINSTON P. HENRY, president of Putnam Oil Company, Houston, is a member of the nominating committee of the Independent Petroleum Association of America, which will hold its annual meeting this week in Houston in connection with the International Petroleum Exposition.

CHARLES H. SNELSON, formerly with Skelly Oil Company's Houston office, left last week for Corpus Christi, where he will be head of Seaboard Oil Corporation's production office.

J. S. HUDNALL, consulting petroleum engineer, Tyler, and W. W. Trout, Lufkin Foundry and Machine Company, Lufkin, have recently been appointed members of the Texas State Board of Registration for Professional Engineers.

W. B. PYRON, vice president of Gulf Oil Corporation, Houston, recently returned from a trip to Pittsburgh.

H. J. HAWLEY, manager of the production department of Standard Oil Company of Texas, Dallas, was a Houston visitor last week.

J. P. HAYS, formerly district petroleum engineer for Shell Petroleum Corporation in the Texas and Louisiana Gulf Coast area, has been added to the petroleum engineering staff of the Agricultural and Mechanical College of Texas, College Station, Texas, as associate professor. A. B. Stevens of the same department has been raised to full professor.

W. C. WEAVER, scout for Tide Water Associated Oil Company in the Corpus Christi, Texas, district, was a recent visitor in Houston.

DIED:

LESTER JOHN BERRAY, 83, pioneer rigging contractor of McKean and other Pennsylvania counties, died September 26 after an illness of seven weeks at his home in Bradford. Surviving are three sons, two daughters, one sister, 19 grandchildren and seven great-grandchildren.

JAMES B. CUTSHAW, 70, rigging contractor in Ohio, Oklahoma, Texas, West Virginia, Louisiana and Michigan fields for the past 45 years, was instantly killed September 26 by a falling timber in an oil derrick near Otsego, Allegan County, Michigan. He had made his home in Michigan for the past five years, residing in Alma. At one time Cutshaw was superintendent of production for Smith & Son Oil & Gas Company of Okmulgee, Oklahoma, and later served as superintendent of rigging construction for The Pure Oil Company of Oklahoma. Survivors include the widow, two sons and two daughters. Another son, Denver, 22, lost his life August 27 in the same manner while working in the Gladwin field.

S. P. FERGUSON, 26, of Tyler, was fatally burned October 5, and V. L. Griffin and L. C. Hatcher were injured by a gas explosion while working on a rotary rig in the north portion of the East Texas field. The men were employed by John F. Merrick, Inc., Tyler contractor. Natural gas settled in a valley near the rig, and was ignited by fire under boilers.

E. D. WILSON, oil field worker of Marlow, Oklahoma, was fatally injured October 3 when an oil derrick at Olson-Parsons-Wisdom, Blake 1 collapsed while the well was being changed from cable tool to rotary equipment. His widow survives.

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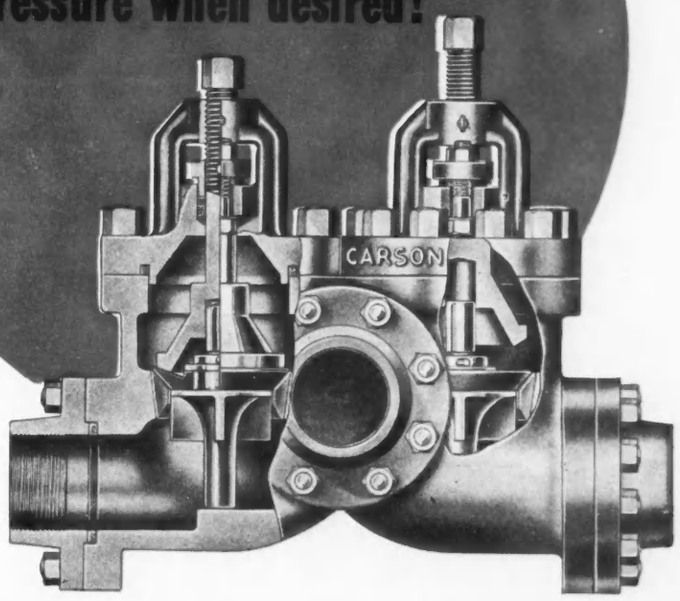
A COMPLETE MANIFOLD VALVE!

Assures positive seal against pump pressure when desired!



Here is Carson's newest and most outstanding development in a Slush Pump Manifold Valve—an Automatic Lock-down type which eliminates the necessity of any additional valves in the mud line between the manifold valve and the pumps.

The automatic feature can be closed and a complete seal effected against the pump pressure when so desired. It is simple in design, rugged construction and provides dependable, efficient service at all times. It can be quickly installed; has removable valve and seat, assures perfect sealing and positive switching, allows for easy replacement of parts, and is quickly repaired.

The new lock-down type feature will fit any Carson Manifold or "T" Valve already in use. All you need to do is order the new style valve cap assembly.

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WORLD DEVELOPMENT and TECHNOLOGY

Edited by
WM. V. GROSS, Associate Editor

Canadian Market Relieved

Lower pipe line tariffs and freight rates arranged to better Turner Valley movement

Establishment of a plan for making potential tests of producing wells and reductions of five cents a barrel in pipe line charges for transporting crude from the Turner Valley field to Calgary and a 50 percent reduction in freight rates for casinghead gas between Calgary and Regina were developments of the past week tending to clarify the unfavorable marketing situation faced by operators of Alberta, Canada.

Proration limiting production to 65 percent of potential was ordered by Imperial Oil Company, Ltd., and the British American Company, buyers of Alberta crude, several weeks ago and brought a storm of protest by operators who pointed to unrestricted imports of crude coming in from Montana and Mid-Continent fields. Formation of the Petroleum Producers' Association to work out a solution for operators in the rapidly growing Turner Valley field was immediately effected. First tangible result of the organization's efforts was announcement a week ago that the Imperial company was discontinuing purchases of Montana crude.

At a meeting attended by members of the association, J. H. McLeod and S. F. Heard, representing the Imperial company, George Watt, representing the British American company, and C. W. Dingman, provincial director of petroleum and natural gas, an agreement was adopted which is to be formally approved by directors of each company and forwarded to Hon. N. E. Tanner, minister of lands and mines, who will be asked to carry out its provisions.

The new pipe line rate for transporting crude from the Turner Valley field to Calgary is 17 cents a barrel, compared to the former charge of 22 cents. Freight rates on casinghead gas obtained from naphtha-producing wells were voluntarily reduced by railways from 60 to 30 cents per hundred. Large quantities are shipped from Calgary to Regina and the new rate will aid in stopping "bootlegging" of Montana blending gasoline across the border which Turner Valley producers say is prevalent at the present time.

W. S. Campbell, chairman of the association's marketing committee, was directed to appoint a committee of six to investigate, with government assistance, the matter of conservation of gas now wasted in the Turner Valley field. It was pointed out that from 76 wells there is 176,000,000 cubic feet of gas wasted daily with little return to producers.

Share Royalties test blew in unexpectedly October 1 throwing crude far above the crown block, indicating a well of 2000 or more barrels daily and proving conclusively that the Turner Valley crude pool of Alberta, Canada, extends to the west of all producers so far completed. While official production figures were not to be released for several days, estimates of visitors to the site indicated initial daily production may be as high as 3000 barrels, which would make the test the largest yet drilled in Canada. Gas pressure appeared to be greater than at any other well so far completed in the valley.

Location is Legal Subdivision 8, Section 29, Township 18, Range 2, about a quarter-mile west and slightly south of the B. & B. producer. Bottomed at 7309 feet, 380 feet in the Madison limestone, the well blew in shortly after bailing of rotary fluid was started. There was about 3500 feet of drill stem in the hole which had to be removed before the well could be controlled. The strike improves considerably the chances for production of several other wells near completion to the west of present Valley crude producers.

Production figures for Brown Oil Corporation's No. 1 and No. 2 and for Mercury Oils No. 8, which stopped drilling a week ago, were not available as the week closed.

Rotary mud was being cleared by Model-Spooner-Reward Royalties test, Legal Subdivision 4, Section 28, Township 18, 2-w5, and by Granville Oils, Legal Subdivision 16, Section 29, Township 18, 2-w5, both giving indications of good production. The Model-Spooner-Reward Royalties test is located just north of Davies Petroleums, Ltd.'s No. 2, at present the leading producer in the Turner Valley field. It stopped drilling at 6930 feet, 469 feet in the Madison. The Granville test stopped at 7321 feet, 471 feet in the Madison.

Completed in Mid-September with initial flush yield of 2645 barrels which dropped to 2016 barrels daily three days later, the Davies No. 2 has been producing approximately 1400 barrels daily under proration limiting production to 65 percent of open flow now in effect in Turner Valley. Figures for the past week show the daily yield to fluctuate between 1375 and 1416 barrels.

Union Drilling Company spudded in Scottie's Petroleum Syndicate's test on Legal Subdivision 16, Section 19, Township 18, 2-w5.

National Petroleum Corporation will be the first Turner Valley operating company to change from rotary tools to standard equipment for completing a test in the lime. The change is being made at the company's No. 1, Legal Subdivision 2, Section 29, Township 18, 2-w5, now bottomed at 6805 feet. Robert Wilkinson, president of the company, said the change would be made as quickly as possible, drilling operations scheduled to start again by October 12. The decision was influenced by the performance of recent rotary drilled wells which have been slow in clearing themselves of rotary mud. Meanwhile, the company's million-dollar rotary outfit will stand idle. William Calder, former director of the provincial petroleum division, has long advocated use of cable tools for drilling in productive horizons.

Cellar is being completed for Brown Oil Corporation's No. 4, Legal Subdivision 4, Section 21, Township 18, 2-w5. The No. 3 was drilling at 4890 feet.

Immediately south of the Davies No. 2, the Bersac Royalties No. 1 is to be drilled on Legal Subdivision 12, Section 21, Township 18, 2-w5. Work is already started on the lease, and the test is being financed by British American Oils, Security Assets, Calmont Oils, Charles C. Ross and Newell & Chandler. The latter firm will be in charge of drilling.

On Hunter Valley structure, Hunter Valley Oil Company's MacLaren No. 1 wildcat is to be completed at approximately its present depth. The well was drilling at 8274 feet as the week closed.

On the Watson structure, cellar is being dug for Mar Jon Oil Company's No. 4 on Legal Subdivision 3, Section 29, Township 9, 2-w5. At this company's No. 3 on this structure, rotary derrick has been erected and arrangements are being made to secure equipment to replace the cable tool outfit which was used to drill to its present depth, 5530 feet.

OKLAHOMA FIELDS

Billings pool well showing for slight extension.

* * *

Deepened Fitts well produces and revives activity.

Oklahoma City.—In the Billings pool of Noble County, Tide Water Associated Oil Company's Derr 1, SEc NW 16-23n-2w, was making favorable showings, indicating it will be a one location northwest extension. After topping Wilcox sand at 4322 feet, it cored from 4323 to 4327 feet and recovered a full core with good saturation. It was running 7-inch casing at 4322 feet.

At the south end of the pool, Tide Water Associated Oil Company's Falke 2, NWc NE 28-23n-2w, appeared as a producer as a flow string was being set at 4350 feet. Top of the Wilcox sand was 4341 feet. The company's Falke 3, NW NE NE 28-23n-2w, was drilling below 3715 feet in lime.

Champlin Refining Company's Gassoway 1, NEc NW 28-23n-2w, which defined the southwestern limits of production in the field, will plug back. After rigging up standard tools early last week, it swabbed 75 barrels of oil and 203 barrels of water in 24 hours, from 4367 feet in the Wilcox sand.

Continental Oil Company's Conway 9, NE SE SW 16-23n-2w, made a potential of 1647 barrels of oil along with 2,120,000 cubic feet of gas, from 4287 feet.

Darby Petroleum Company's McCoy 1, SEc SW 24-23n-2w, a wildcat two miles east of Billings was drilling at 4350 feet. It had top of the Oread at 2550 feet; the Avant at 3235 feet and the Oswego at 4073 feet.

Another wildcat was abandoned last week. It was H. R. Hollenback et al's Norman 1, NWc NE 17-9n-2w in the Norman sector of Cleveland County at 7696 feet. It had salt water in the Wilcox sand, topped at 7645 feet; Hunton lime at 7018 feet; Sylvan shale at 7175 feet; Viola lime at 7275 feet; Simpson dense at 7345 feet and sandy dolomite at 7625 feet.

Stanolind Oil & Gas Company and Amerada Petroleum Corporation's Pfeiffer 9, NW SW SW 33-20n-2w, in the Lucien pool of Noble County, unloaded the hole after drilling to 5075 feet in the Wilcox sand. It averaged 163 barrels of oil per hour during a 4-hour test with drill pipe in the hole.

W. R. Curry et al's Schlopp 3, NE SE SE 32-20n-2w, cleaned out the bridge near 5095 feet where it was shot, and was starting a production test. Anderson-Prichard Oil Company's Grininger 1, NE NW SW 4-19n-2w, southern outpost test, was drilling below 4975 feet, and is checking low. Champlin Refining Company's Pfeiffer 9, NW SE NW 4-19n-2w, was drilling plug at 4923 feet in the Wilcox sand.

Seaboard Western Oil Company's Guthrie 1, NWc NE 6-20n-2w, which extended the pool southeast, was rigging up standard tools at 5436 feet in the Wilcox sand.

Near Langston in eastern Logan County, Sunray Oil Company and Olson Drilling Company's Canning 1, SWc NE 31-17n-1w, was drilling below 5583 feet. On a drill-stem test of the Wilcox sand at 5558 feet, it showed salt water.

Ohio Oil Company's Dahl 15, SE NE SE 31-14n-3w, which found the Wilcox sand low on the east side of the Edmond pool of Oklahoma County, went to 6710 feet in the sand for a good show of oil and gas. Casing set at 6574 feet is waiting on cement.

Stephens County deep test may go beyond 10,000 feet

Ardmore.—The fourth deepest test drilled in Oklahoma was at a standstill last week after having reached the contract depth of 10,000 feet. It is Coline Oil Company's Johnson 1, SW SE NE 1-2n-8w, northwest of Marlow in Stephens County, which was conditioning the hole to run casing. Evidently this will be done to keep the hole in condition in the event it was decided to drill deeper.

Wasteka Drilling Company's Pharris 1, SEc NW 24-6n-12w, east of Alden in Caddo County, was shut down at 6522 feet, and observers state it looks like a dry hole.

West of the Cement pool, Indian Territory Illuminating Oil Company's Darby Community 1, CNE SE 29-6n-10w, was taking a survey of the hole which was bottomed at 4942 feet.

Gulf Oil Corporation's Thomas 1, SW NW NW 14-4n-5w, 6 miles south of Bradley in Grady County, was drilling below 8160 feet in a shale in the Pennsylvanian. It had Granite wash at 8100 to 8115 feet with an odor of oil, and sand from 8150 to 8160 feet with a small show of oil.

Carter Oil Company et al's Harley Community 1, CNE NE 24-2s-4w, in the Milroy area of Stephens County, made a 24-hour flow of 1817 barrels of oil and from 2 to 3 percent salt water and some sulphur gas. The flow was through 2½-inch tubing, producing from 8157 feet in Oolitic lime.

Carter Oil Company's Carter-Harley 1, CNW NW 19-2s-3w, just across the line and in the Fox area of Carter County, was drilling at 2451 feet.

Gulf Oil Corporation's Johnson 1, CSW 27-2s-3w, was drilling below 6269 feet and Smith Estate 1, CSW SW 26-2s-3w, was drilling below 6267 feet.

In Murray County, southeast of Davis, Sinclair Prairie Oil Company, Power Oil Company et al's Lancaster Trust Company 1, CSW NE 10-1s-2e, recovered stuck drill pipe and was coring below 4314 feet.

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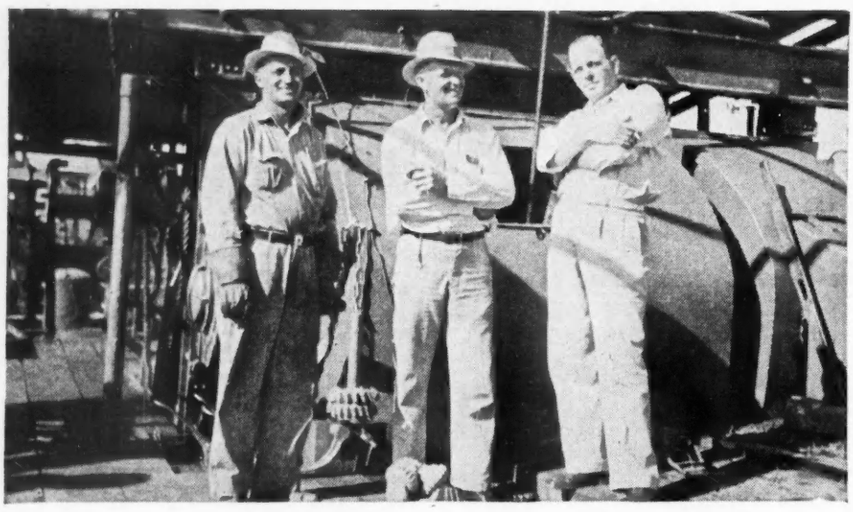
Jesse pool outpost test promises production

Tulsa.—Drilling operations in the Tulsa area picked up last week as a possible extension well was seen for the Jesse pool; a well nearly 1 mile north of the Fitts field was getting production, and a new test was announced for the recently opened shallow area near Verdigris in Rogers County.

Continental Oil Company's Hale 1, C EL NW NE 2-1n-7e, swabbed and flowed 123 barrels of oil in 24 hours, from 4470 feet in Hunton lime. This followed acidization with 3000 gallons. On a later test, it was reacidized with 7000 gallons and after flowing off the oil load was shut in for tankage. It is ½ mile north of production.

Activity in the Fitts field was given a substantial boost as an old dry hole, nearly one mile north of present production, was drilled ahead for production from the Hunton lime. It was W. M. Smith, N. D. Christian and Arrow Drilling Company's Christian 1, SW SE SE 16-2n-7e. It was reported to have drilled in the Hunton from 4180 to 4200 feet, perforated casing and acidized with 2500 gallons. It was opened for 30 minutes and made a flow of around 86 barrels of oil. Estimated production, based on these figures, would be approximately 150 barrels per hour. It was still shut in when last reported. Originally drilled by Schermerhorn Oil Company, the test was carried to 2024 feet and abandoned. The new operators took over and

Lucien Well Makes Drilling Record



E. W. Hughes Drilling Company recently made an outstanding run in the Lucien field of Oklahoma. The record occurred when drilling Incorporated Petroleum Producers Schlopp 3. The drilling time under the surface pipe to bottom at 4967 feet was 21 days including the cementing of a 7-inch oil string. Moreover, only 24 bits were used, whereas it sometimes requires from 28 to 30 to reach the 4900-foot Lucien sand. At no time was the hole more than one degree from vertical. Shown in the picture are the three drillers (left to right) J. P. Joyce, evening tour; D. B. Broyles, day tour; and J. M. Seibert, morning tour.

drilled ahead for production. It is thought at least 12 offsets will be forced by the new producer.

Three hundred feet south of T. H. McGilless et al's Big Lake Club 1, SE NW SE 23-20n-15e, discovery well of the shallow producing area south of Verdigris in Rogers County, another test is preparing to go down. It is J. C. Cain et al's Meadors 1, NE SW SE 23-20n-15e, and will also seek production from the Dutcher sand. Club 1, bottomed at 876 feet in the sand, was shut down while waiting for pipe line connections.

Carter Oil Company et al's Claytor 1, C W½ NE SW 27-2n-9e, near Centrahoma in Coal County, was drilling below 6142 feet in Viola lime. Earlier in the week a test was made with packer set at 6006 feet, but showed only two stands of mud when opened for 6 hours. It cored from 6122 to 6127 feet and recovered 2 feet of Viola lime with a small show of oil. Another core from 6127 to 6137 feet had a 2-foot recovery with a stain of oil.

In another part of the county, south of Chandler, Ardie Oil Company State 1, NEc SE 16-14n-4e, did an about face by showing for oil after making a poor showing on a drill stem test. Drilled to 3948 feet, another drill stem test was made and resulted in the show.

Out in Haskell County, Continent Oil Company's Ferguson 1, SW SE NE 33-8n-20e, on the Kinta anticline, had top of the Wilcox sand at 6910 feet and was drilling below 6970 feet in hard, dry sandy dolomite.

Deep Rock Oil Corporation's Eakers 2, SEc SW 35-15n-2e, in the Wellston area of Lincoln County, had the Wilcox sand from 5060 to 5081 feet and flowed 169 barrels of oil in 24 hours through casing. It was shut in and may be acidized.

Refiners Committee holds regional session at Tulsa

Tulsa.—The second 1937 regional meeting of the manufacturing committee of Western Petroleum Refiners Association was held in Tulsa October 5. The morning program was opened by Boyd Guthrie, associate chemist, Bureau of Mines, Bartlesville, speaking on the relation of the bureau with the oil industry, particularly as applied to the refining end. He outlined a portion of the investigations made by the bureau, briefed the benefits of combined effort by the government agency and by individual concerns, and extended an important invitation to the petroleum refiners in the nature of a suggestion that they refer particular problems to the department. Guthrie closed his talk by a brief description of the new bureau building at Bartlesville, illustrated by slides of interior furnishings.

A detailed discourse on the reasoning behind Diesel fuel specifications was given by T. B. Rendel, of Shell Petroleum Corporation's refinery at Woodriver, Illinois. Fundamental requirements were shown to be specific with Diesel engines as opposing fucl for other types of machinery. C. W. Berger, chief chemist of Globe Oil and Refining Company, McPherson, Kansas, discussed in general various aspects of crude utilization and its relation to the evaluation of crude oil by the laboratory technician. A visit to the Tulsa refinery of Mid-Continent Petroleum Corporation by all those attending the meeting closed the session.

Bartlesville.—Executives of Phillips Petroleum Company were host October 6, to officials of several railroads and oil companies when the annual transportation outing given by the company was held. Starting with a golf tournament, the group concluded the day with a barbecue on the Frank Phillips ranch.

OKLAHOMA
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CADDO COUNTY—		
Magnolia, Henley 1, ne ne se 35-6n-10w	950	3374
CARTER COUNTY—		
Carter Oil Co., Junior Perkins 2, sw ne se 4-1s-3w	*	2805
CLEVELAND COUNTY—		
Gulf, James 2, se nw sw 27-10n-2w (otd 7281)	155	7289
COAL COUNTY—		
Carter & Gulf, Buck 1, se se sw 6-1n-8e	215	3964
COMANCHE COUNTY—		
Guy Anderson, sw ne ne 30-2n-9w (otd 2032) (pb 2087)	47	2090
CREEK COUNTY—		
Lease & Investment Co., Allen 1, se ne se 35-15n-10e	85	2544
Schoolcraft & Ferguson, Fulkerson 6, sw se nw 5-17n-7e (otd 1458)	*	2256
Link Oil Co., G. Jones 8, se nw se ne 32-18n-7e (otd 1428)	40	2270
GARVIN COUNTY—		
Cox & Hamon, Perry 3, nw se sw 32-1n-3w	200	3204
GRADY COUNTY—		
Gulf Oil Corp., Gibson 2, ne nw sw 16-3n-5w (pb 1835)	5	1981
HUGHES COUNTY—		
W. O. Allen, Barnard 1, sw sw sw 24-8n-8e (pb 3307)	¶2	4274
JACKSON COUNTY—		
Gulf Oil Corp., Badger 1, sw sw ne 5-1s-19w (pb 2537)	46	2537
Burrows 1, ne ne nw 6-1s-19w (pb 2590)	¶25	2590
LOGAN COUNTY—		
Mid-Continent, Bulling 2, se ne nw 5-19n-2w	*	5098
NOBLE COUNTY—		
Phillips & Shell, Hackett 4, sw se se 21-23n-2w	4229	4333
OSAGE COUNTY—		
Branstretter et al, 2, ne nw nw 33-22n-11e	25	2062
Coralena Oil Co., 1, ne ne se 29-24n-7e	*	2665
Lewis Prod. Co., 3, ne nw nw 34-24n-7e	130	2701
W. C. Norris, Inc., 8, sw ne se 24-25n-8e	10	2390
R. L. Berlin, 3, nw sw nw 24-29n-10e (otd 1048)	5	1694
PAWNEE COUNTY—		
Tuttle O&G, Degner 1, se ne ne 22-20n-7e	*	3071
PONTOTOC COUNTY—		
Moore, Blackstock 1, ne nw ne 4-1n-7e	12	4430
Blackstock 2, sw ne ne 4-1n-7e	5	4028
Continental Oil Co., Brown 2, nw nw ne 11-1n-7e (pb 4585)	534	4722
McCarty 5, nw se nw 12-1n-7e	879	4743
Patsy, Mayhue 1, nw ne se 20-2n-6e	66	3331
Sinclair Prairie, Moody "B" 6, se nw nw 22-2n-7e	3703	3878
Moore, Harper 7, nw nw ne 29-2n-7e (otd 3785)	77	2794
Benedum & Trees, Mole 10, ne nw ne 31-5n-5e	*	2691
POTTAWATOMIE COUNTY—		
Magnolia, McMoran 1, sw sw nw 32-11n-5e (pb 4840)	30	4853
SEMINOLE COUNTY—		
Troup, Wright 3, sw ne ne 32-7n-6e	414	2959
Mid-Continent, J. Smith 18, sw sw ne 5-7n-7e	45	3274
Winona, L. Fish 1, ne nw ne 19-7n-8e	140	2990
Pure, Reede 12, nw sw se 14-8n-6e (otd 4244)	198	4284
Texas, E. M. Wright 3, nw ne ne 32-7n-6e (pb 2937)	140	2951
STEPHENS COUNTY—		
Geo. L. Pace, Houston C3, cw½ nw sw 2-2s-8w	*	2690
TULSA COUNTY—		
J. D. Swift et al, Bruner 1, se ne se 34-19n-10e	*	1621

*Failures; †Junked; ¶Million cu. ft. gas.

KANSAS FIELDS

New Barton County pool apparently proves trend.

* * *

Ten-year record for gas flow is broken by well.

Wichita. — Barton County took the lead in drilling activity for Kansas last week, reporting one new pool, a new producer in an area flanked on all sides by good production and extending production in two pools. Barber County also put in an active week, one well showing for a pool opener and another producing more gas than any other well in the county during the past 10 years. Developments were correspondingly good in other parts of the state.

Shell Petroleum Corporation opened the new pool for Barton County at Peterman 1, SE NE SE 13-16s-14w, 1½ miles southwest of production in the Barton County portion of the Trapp pool. The well filled 2650 feet with oil in 7½ hours after plugs were drilled at 3341 feet, top of the Siliceous lime. The test had been cored between 3361 and 3366 feet in the formation, getting spotted oil stains. Apparently it proves production on a trend extending through northern Barton and southern Russell counties.

Stanolind Oil & Gas Company's Stukemann 1, NEc SW 11-20s-11w, in an area flanked on four sides by production, the farthest only a half mile away, was showing for a producer. Drilled to 3281 feet, where it found top of the Siliceous lime, the well was cored to 3285 feet and recovered a saturated core. It is a half-mile south of the Kowalsky area; one mile southwest of the Silica pool; three quarter-mile north of the Peter pool and two miles northeast of the Ellinwood pool.

Half-mile north extension for the Steuder pool was reported as swabbing started at Stanolind Oil & Gas Company's Morrison 1-B, SEc NW 26-16s-13w. Plugs were drilled at 3399 feet in the Siliceous lime and it swabbed 16 barrels of oil per hour. It will be acidized before a production test is made.

Trapp Pool Extended

Production was extended another location south in the Barton County portion of the Trapp pool by Phillips Petroleum Company's Henry Bitter, Jr. 2, SE NE NE 6-16s-13w, swabbing 300 barrels of oil in 8 hours from Siliceous lime at 3336 feet.

Another oil and gas pool was in prospect for Barber County as Colonial Oil Company and Helmerich & Payne's Blunk Estate 1, C SE 18-34s-13w, had a showing of oil and gas, presumably in the top of the Viola lime, at 4900 feet. It is 2½ miles southwest of Barbara Oil Company's Holmes 1, C E½ SE 15-33s-13w, which encouraged the effort to find flank production on the Medicine Lodge dome. Originally completed at 4847 feet, Holmes 1 was carried to 4851 feet and made a potential of 763 barrels of oil and 15,000,000 cubic feet of gas.

The largest gasser for Barber County since 1927 was brought in last week, making 40,000,000 cubic feet, producing from the Mississippi lime at 4558 feet. It was Barbara Oil Company et al's Thompson 1, C SW SW 22-33s-13w, southwest of the Medicine Lodge pool. It is also a north offset to Holmes 1.

Gulf Oil Corporation's Stout 1, NEc 6-18s-10w, new producer in the Habiger area of Rice County, flowed 46 barrels of oil in one hour from the Lansing lime at 2998 feet. When drilled to 3024 feet, still in the lime, it flowed 562 barrels of oil in 11 hours through perforated liner. Tubing is being run for a potential test. It is a west offset to the discovery producer for the area. Top of the lime was found at 2945 feet and at 2977 feet the hole filled 2000 feet with oil. Gas was estimated at 2,000,000 cubic feet.

Indications are the Lerado pool of Reno County will be extended one-half mile southwest as A. R. Jones' Shepherd 1, NWc 22-26s-9w, found saturation between 4148 and 4151 feet in the Viola lime. Casing was being run to 4148 feet.

Deep Rock Oil Corporation's Baumer 20, SE NW NE 27-11s-17w, in the Bemis pool of Ellis County, last week made a pumping potential of 3430 barrels of oil, declared by conservation officials to be the largest pumping potential ever given a well in the state. At 3530 feet in the Siliceous lime, the well pumped 577 barrels of oil the first 4 hours and 571 barrels the next 4 hours. Top of the lime was had at 3516 feet.

An attempt to extend production southeast is being made at Cities Service Oil Company's Hall 1, NWc 26-11s-17w. Hall 1 offsets the Baumer lease in Section 27, property of Deep Rock Oil Corporation.

Earl Wakefield et al's Burnett 1, NWc NE 1-11s-18w, which opened a new producing area for Ellis County two weeks ago, was setting 5-inch casing at 3570 feet after drilling to 3574 feet in the Siliceous lime. It had 3000 feet of oil standing in the hole.

Northeast of Claflin, in the Bloomer area, National Refining Company's McLean 1, Section 25-17s-11w, was estimated good for 1200 barrels of oil daily natural. It had a hole full of oil in 12 hours from the Siliceous lime at 3305 feet.

Stanolind Oil & Gas Company et al's Belt 1, NEc SW 13-20s-16w, northeast of Larned, Pawnee County, which made 500 barrels of oil and 27,000,000 cubic feet of gas when brought in, last week was making around 300 barrels of oil. Gas volume has not diminished. Production is from the Siliceous lime at 3832 feet. Preparations for testing were being started.

Skelly Oil Company's Zink 1, SWc 32-17s-10w, in the Becker area of Ellsworth County, is a new producer, making 258 barrels of oil during a 7-hour test, from between 2934 and 3018 feet in the Lansing lime. It is a direct north offset to a well recently completed for 4027 barrels of oil daily, drilled by Bridgeport Machine Company. Full production could not be determined until the hole was unloaded.

Stanolind Oil & Gas Company's Burmeister 3, SE NE SE 35-19s-11w, in the Barton County portion of the Silica pool, went into the Kansas City lime at 3065 feet, and between 3104 and 3135 feet it had a small show of oil. Top of the Siliceous lime was found at 3386 feet and after drilling to 3389 feet, it was rigging up standard tools. A show of oil was had in the lime.

Largest producer for the Otis pool, Rush County, was reported as being Morgan, Flynn & Cobb's Crowell 2, SWc NE 23-18s-16w, completed for 2205 barrels of oil and 50,000,000 cubic feet of gas. Production was from the Reagan sand at 3554 feet.

Elmer Ash et al's Broman 1, NEc NW 19-17s-4w, east of Marquette in northern McPherson County, was bottomed at 3053 feet in chat and preparing to run casing. Top of the formation was reported at 3040 feet and the hole is said to be running 164 feet higher on the formation than a dry hole 9 miles southwest.

Harwood Oil Company and W. R. McCluskey's Blair 3, NW SW NW 32-19s-1w, in the Ritz-Canton pool, was abandoned at 3008 feet in chat.

Texon Royalty Company's Letsch 2, SW NW SW 26-14s-13w, set 7-inch casing at 2822 feet and had the pay sand from 2842 to 2857 feet, following which the hole filled 2000 feet with oil in 10 hours. It was drilling at 2932 feet.

Two Rodessa areas being connected

Shreveport.—One-half mile south of production in the Miller County, Arkansas, Rodessa extension and about the same distance north of the producing limits of the Louisiana side of the field, Magnolia Petroleum Company's G. W. Hardy 1, NWc south half Section 1-23n-16w, Caddo Parish, last week showed indications of being a commercial oil well. While no gauge had been made the well was showing about 180 barrels of oil daily through quarter-inch choke by brief flow tests. Total depth is 6055 feet but saturation was logged from 5987 to 5994 feet. However, farther east Freeman W. Burford's Pitts 1, C E½ NW 1-23n-16w, has failed to show oil or gas in swabbing and is being acidized.

KANSAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
BARTON COUNTY—		
T. C. Johnson, Bitter 1, nw nw sw 8-16s-13w	1425	3370
Ohio Oil Co., Kramer 2, cw½ w½ se 9-16s-13w	1013	3393
Stanolind, G. Thorne 1, sw sw se 27-16s-13w	1792	3397
I. T. I. O., Peter 6, sw sw nw 24-20s-11w	2219	3265
Magnolia, Roetzel 13, ne sw se 24-20s-11w	1432	3269
I. T. I. O., Schrepel "A", se ne ne 26-20s-11w	2101	3290
Texas, Disque H. 1, se se sw 3-17s-11w	1037	3344
Wentz, Bemis 6, nw se nw 28-11s-17w	2426	3467
Wolf Creek, Bemis 1, se se sw 33-11s-17w	1125	3623
Gulf, Koerner 2, nw ne sw 11-12s-18w	2118	3672
Texas, F. A. Bemis "A" 13, se nw ne 28-11s-17w	1638	3400
ELLSWORTH COUNTY—		
Yoches, Patzner 2, nw se nw 30-17s-10w	1780	3335
HARVEY COUNTY—		
Ohio, Neufeld 1, se se ne 14-22s-2w.	*	3610
LINN COUNTY—		
Texas, Mundell 21, ne ne se 14-21s-22e	5	449
McPHERSON COUNTY—		
H. Becker et al, Mason 1, sw sw ne 9-17s-1w	*	3470
Continental et al, Huxan 4, se sw nw 29-21s-1w	598	3303
RICE COUNTY—		
Continental, Ainsworth "A" 3, se sw nw 30-18s-7w	1747	3210
Stanolind, Hathaway 3, ne nw sw 33-19s-10w	2299	3286
M. Panning 7, sw se nw 33-19s-10w	2408	3292
Continental, Gum 1, nw sw se 34-19s-10w	756	3315
Cities Service, Proffitt 3, sw nw se 6-20s-9w (otd 3617)	300	3901
Saco, Wickerham 1, ne sw se 7-20s-9w	*	3340
Darby, Oden 1, ne ne ne 6-21s-7w	2868	3343
ROOKS COUNTY—		
Phillips, R. Maddy 1, cse ne 36-8s-18w (pb 3420)	153	3441
RUSH COUNTY—		
Aylward Prod. et al, Brack 1, csw¼ 14-18s-16w (otd 3501)	¶14	3523
RUSSELL COUNTY—		
Cities Service, Rogg 1, se se ne 27-14s-13w	2784	2867
Stearns & Streeter, L. Miller 5, sw se nw 31-14s-13w	965	3131
A. Billings, Herbel "A" 3, ne se nw 35-14s-14w	*	3186
H. Blair, Roeback 10, sw nw nw 2-14s-15w	1950	3300
Central Pet. Foster "B" 11, sw ne ne 3-14s-15w	2268	3315
Transwestern, Wm. Polcyn 9, sw se sw 11-14s-15w	739	3221
Nat'l Ref. Co., South Reinhart 3, ne se se 25-14s-15w	850	3208
Carter Oil, se sw sw 8-15s-13w	1550	2943
Skelly, G. Rein Jr., 3, se ne sw 8-15s-13w	2382	3172
W. I. Southern, Trapp 1, nw nw ne 29-15s-13w	1008	3317
Boomhaur "A" 11, se nw ne 30-15s-13w	2440	3256
Phillips, Hoffman 16, se se se 31-15s-13w	3232	3361
Cities Service, Bender "A" 4, ne se nw 25-15s-14w	1493	3332
Boomhaur 13, ne sw ne 25-15s-14w	1522	3332
Boomhaur 14, sw sw ne 25-15s-14w	645	3328
Texas, J. A. Krug 1, ne ne ne 23-13s-15w	*	3350
SEDGWICK COUNTY—		
Continental, Goodrich 4, se ne sw 16-25s-1e	1143	3334
Dickey, Riley 2, sw ne sw 20-28s-1e (otd 3112)	*	2535
W. G. Talbott, Downs Est. 1, se se nw 32-28s-2e	¶7.33	2232
Palmer Oil, Royal 1, ne ne ne 15-28s-1w	*	3899
STAFFORD COUNTY—		
Stanolind, Spangenberg 2, nw nw nw 29-22s-11w	615	3601
Komarek 8, ne se se 30-22s-11w	1382	3546
Stanolind-Amerada, Fitzgerald 2, se sw sw 22-24s-13w (pb 4129)	*	4133
Kessler O&G, W. R. Jenkins 1, se se ne 15-25s-12w	*	4215
TREGO COUNTY—		
Watchorn, Lempke 2, se ne sw 15-11s-23w	*	3976
F. L. Thorne et al, Koeppen 1, se se sw 31-14s-24w	*	4429
WOODSON COUNTY—		
Pure Oil, Wintershiedt 19, se se sw 6-24s-14e	42	1720

*Failures; †Junked; ¶Million cu. ft. gas.

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THE CONTINENTAL SUPPLY COMPANY

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NEW MEXICO

Lea County wildcat has favorable position.

★ ★ ★

Vacuum pool is rated highly important.

Hobbs, N. M.—Gas showings in the upper lime section logged by The Texas Company's State 1-L, C SW NE 1-18s-34e, Lea County wildcat, confirms the high structural position recorded on the anhydrite and salt markers. It is considered the most important prospect under way in the county, and is located 3¼ miles south of nearest production in the Vacuum 3-well pool. First gas was encountered at 3157-75 feet, with an increase noted at 3234-43 feet. The test was drilling in lime at 3442 feet. Top of anhydrite was logged at 1450 feet, with an elevation of 3998 feet. Broken salt series was entered at 1560 feet.

Magnolia Petroleum Company's State 1-G, NW NW NE 24-17s-34e, southeast outpost for the Vacuum area and the second completion, was given periodical production test late in September, and flowed 89 barrels oil in 11 hours. It was originally completed as a pumper last May after plugging back from 4905 feet to 4794 feet. This company's State-Bridges 3, C SW SE 23-17s-34e, which is one mile south of recent completion that flowed 51 barrels per hour natural from lime at 4430-4593 feet, will spud early this week. Phillips Petroleum Company's State-Lea 1, C NW NW 30-17s-34e, about 4¾ miles southwest of production, failed to respond to dual acid treatments after plugging back from 4952 to 4762 feet.

Reduced allowable for the state placed into effect October 1 by the Oil Conservation Commission to compensate for curtailed runs by pipe line companies was confined to Lea County. Total production was cut 10,500 barrels, giving the state a maximum yield of 104,000 barrels daily during the remainder of October. Producers in Eddy and San Juan counties were not affected. Wells prorated on a flat basis in Lea County were cut from 77 barrels to 68 barrels daily, although earlier reports indicated that the reduction would not be so great.

Further decline in field operations is likely to occur in Lea County on the strength of the lower production allowable. The slump was not evident the past week, as Lea County accounted for 14 completions, including 12 oil wells, a gasser and a semi-wildcat failure, and during this period 7 areas added 13 new operations.

Operations in the Monument field are largely confined to the north and south ends. Two new completions pave the way for progressive offsets in the north sector. Amerada Petroleum Corporation's State 2-G, C NW SW 18-19s-37e, gauged 169 barrels oil in 2½ hours, flowing through open tubing, after using 2000 gallons of acid at 4045 feet. Gulf Oil Corporation's Kyte 1, C SE SE 7-19s-37e, expanded the north rim of production with a flow of 214 barrels oil in 2½ hours after using acid at 4025 feet, or 325 feet sub-sea. Two new operations consists of Continental Oil Company et al's Sanderson 4-A-14, C NW SE 14-20s-36e, and Stanolind Oil & Gas Company's Gilluly 12-A, C NW NW 24-20s-36e.

South trend of production for the Skelly field did not prove attractive for Continental Oil Company et al's W. A. Cline 1, C NE NW 15-23s-37e, which pumped 11 barrels initial after plugging back from 3858 feet to 3672 feet for nitro shot in the sandy lime zone.

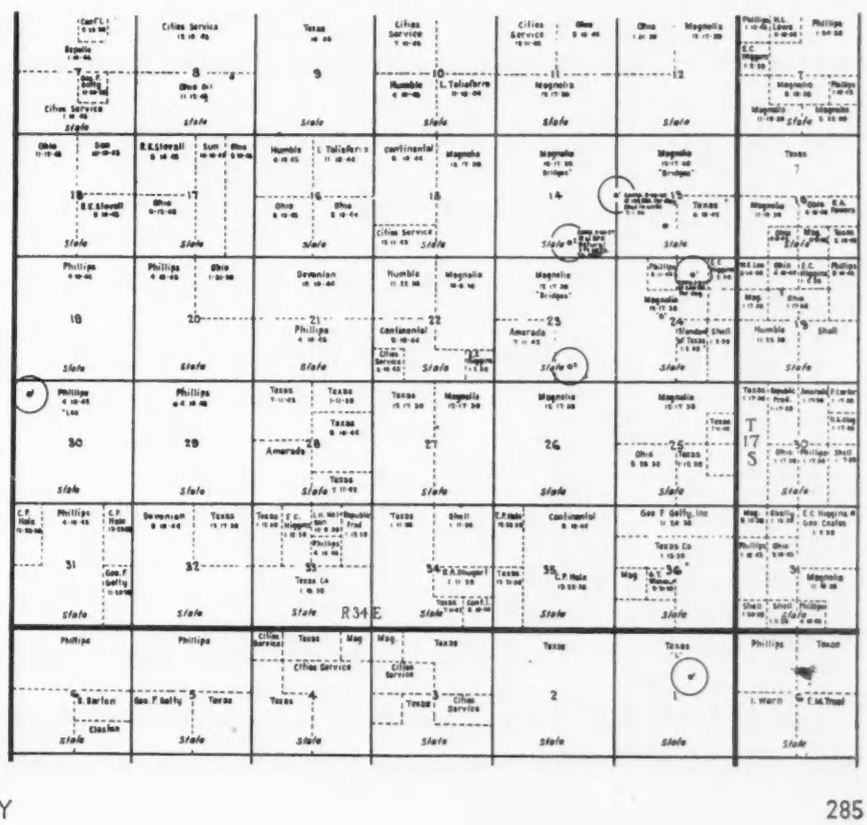
Estimated flow of 100,000,000 feet of dry gas was developed by Cities Service Oil Company's Closson 6, C SW SE 6-22s-36e, when rotary returns were lost at 3635-37 feet. Production was killed with 500 tons of mud, and cased off when 7-inch pipe was cemented at 3750 feet. It is a northwest diagonal offset to the largest producer in the south portion of the Eunice field. New locations for this area, includes Mid-Continent Petroleum Corporation's Boren 2, C SE NE 20-22s-36e, and Skelly Oil Company's State 1-H, C W½ SW NW 25-20s-36e, and State 2-H, C W½ NW NW 25-20s-36e. The latter two are exceptions to the usual spacing plan.

Conversion of The Texas Company et al's W. H. Rhodes 2-A, SE NW SE 22-26s-37e, second producer for the Rhodes pool, from a dry gasser to an oil producer enhances the outlook for the area. Great Western Producers, Inc.'s State 1, SE SE SE 16-26s-37e, is a new project about ½-mile northwest of the original well. Rhodes 2-A was completed last June after nitro shot, and the following month began spraying 25 barrels oil daily. Production has since increased to 64 barrels daily.

NEW MEXICO
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
EDDY COUNTY—		
Continental, Barrett 1-A-14, c se se 14-20s-30e	*	2274
Nash-Windfohr & Brown, Stevens 2-A, c nw sw 13-17s-30e	265	3479
LEA COUNTY (Eunice)—		
Cities Service, State 1-H, c ne ne 17-22s-36e	60	3914
Continental, State 1-E-17, c se se 17-22s-36e	221	3842
Mid-Continent, Greer 4, c sw nw 21-22s-36e	750	3830
LEA COUNTY (Hardy)—		
Magnolia, Gen'l Crude & R.R. Penn Est., C. Hardy 1, sw sw nw 29-21s-37e	120	3776
LEA COUNTY (Langlie)—		
Anderson Prichard, Langlie 2, c ne se 8-25s-37e	360	3466
Stanolind, Langlie 2-B, c nw nw 15-25s-37e	¶10	3458
LEA COUNTY (Monument)—		
Amerada, State 2-G, c nw sw 18-19s-37e	1500	4045
Continental et al, Sanderson 3-B-10, ne ne se 14-20s-36e	500	3891
Gulf, Kyte 1, c se se 7-19s-37e	2000	4025
Shell, State 4-E, c sw nw 13-20s-36e	1710	3887
LEA COUNTY (Skelly)—		
Continental et al, W. A. Cline 1, c ne nw 15-23s-37e	11	3858
LEA COUNTY (Penrose)—		
Ohio, J. W. Grizzell 2, c nw se 5-22s-37e	1200	3750
LEA COUNTY (Vaccum)—		
Magnolia, State-Bridges 2, c sw se 14-17s-34	1200	4593
LEA COUNTY (Wildcat)—		
Nat'l Drl. & Prod. Co.-F. Moss, H. A. Flint-Conoco 1, c ne ne 29-20s-34e	*	3772

*Failures; †Junked; ¶Million cu. ft. gas.



Heralded as the next important lime development in Lea County, the Vacuum pool has 2 tests underway along a south trend from the 3 producers completed by Magnolia Petroleum Company in the 4600-foot zone. New Mexico owns all the land in this area. (Map courtesy Zingery Oil Map Company, Ft. Worth.)

NORTH AND WEST TEXAS

General tapering off of activities to be anticipated.

* * *

Jordan pool well flows 482 barrels hour for record.

Midland, Texas.—Reduced proration allowables applicd generally to West Texas fields for the October period and curtailment of oil purchases by three majors forecasts a gradual tapering off of field operations during the remainder of the year. An abrupt drop is not anticipated, as necessary offsets will continue to be drilled.

South Ward County and the Goldsmith field, Ector County, are experiencing the most difficult market situation. The latter has been the most active area in the district since the fore part of the summer, and affords ample proved locations to maintain its leadership another year.

Normal development of new producing fields in the north portion of the Permian Basin will provide in the aggregate an important drilling program. Approaching completion of a pipe line outlet for the Wasson and Bennett fields will undoubtedly stimulate development work.

Goldsmith Extended

Expansion of the Goldsmith field more than one mile along the west flank appeared favorable when Rogers & Rogers T. P. Land Trust 1-B, NEc of T & P Ry. Section 1, Block 45, T-1-S, cored oil-saturated lime between 4248 and 4289 feet. Pipe has been cemented above this zone for completion. South portion of the field continues to lead in potential yields. Gulf Oil Corporation's Goldsmith 43 earned an initial rating of 4476 barrels of 38 gravity oil after using acid at 4235 feet. Phillips Petroleum Company and Pure Oil Company's Cowden 14 tested 4213 barrels potential after using 5000 gallons of acid at 4165 feet. Landreth Production Corporation's Scharbauer 1-L, SE SE NW Section 20, Block 44, T-1-N, more than ½ mile northwest of its discovery gas and distillate well, flowed 20 barrels of oil hourly after using acid twice at 4192 feet. Casing seat was dislodged, and a heavy flow of dry gas broke through from above. The company's discovery experienced the same difficulty.

New Record for Jordan

New potential record for the Jordan pool, Crane County, which is definitely related to the Judkins (Penwell) field, Ector County, was set by The Texas Company's University 1-D, SE SE NW Section 13, Block 35, when it flowed 482 barrels per hour for three hours through open casing and tubing. The well flowed natural from lime at 3505-38 feet, with an elevation of 2800 feet, The prolific pay was tapped September 23.

Third Seminole Producer

Completion of a third producer for the Seminole pool, Gaines County, was underway late last week. Ohio Oil Company's Averitt 1, west offset to the discovery, was testing at 5073 feet, with packer installed on tubing. Porous zone at 5027-55 feet was treated with 5000 gallons of acid, but the well failed to yield oil with a flow of 4,000,000 feet of gas daily.

Offset drainage has forced the entry of two additional majors into the Wasson field, Gaines County. Humble Oil & Refining Company has started work on Riley 1, NEc Section 381, and Shell Petroleum Corporation has made location for Cox 1, NEc Section 380, Block G. Allowable production of the eight completed wells was cut from 160 to 129 barrels daily on the October schedule.

The Texas Company's Walker 1, southwestern Yoakum County outpost for the Wasson area, showed 2000 feet oil in hole after cleaning out following second nitro shot. It was plugged back from 5180 to 5162 feet.

Standard Oil Company of Texas' Sawyer 1, C SE SE Section 576, 1½

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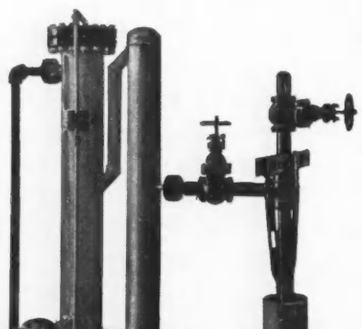

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UNION GAS SYSTEM, INC. Independence, Kansas

WEST CENTRAL TEXAS Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
BROWN COUNTY—		
W. T. Daniels et al, Joyner 1.....	*	1624
CALLAHAN COUNTY—		
Hugh King, Jr., et al, Liggett 1...	*	1937
Pueblo Pet. Co., Snyder 1-B.....	*	1138
R. F. St. John et al, Perkins 1.....	*	1769
J. T. Tuohy et al, George 1.....	*	949
EASTLAND COUNTY—		
Beard & Taylor, Fox 1	*	1237
Dorothy Oil Co., Taylor-Beard 1...	*	1400
ERATH COUNTY—		
Carpenter Oil Corp.-Jess Hickey, Martin 1	72	2867
SHACKELFORD COUNTY—		
Albany Oil Co. & Pardue, Davis 13	50	1631
Butler & Horn, Morris-Buie 16.....	50	1613
Canyon O&G Co., Herron 1	*	744
Charter Oil Co., Mimms 11	181	1602
Hickok & Reynolds, Matthews 22..	35	1041
Nail 6-A	100	1480
Nail 7-A	160	1530
Jaggars & Parrott Prod. Co., Huber 1	*	604
Knight & Ewing, Jeter 11.....	10	1220
Merrick & Lamb Drl. Co., Matthews 1-E	†	834
Price & Ledbetter, Swenson 1.....	4	1590
Roeser & Pendleton, Inc., E. S. Dawson 38	*	3566
E. S. Dawson 40	201	1623
T. K. Simmons et al, B. C. Harvey 14	15	1640
Homer Slicker et al, Matthews 9..	8	897
Tannehill et al, Matthews 36.....	*	1148
Westexas Oil & Roy. Co. et al, E. S. Dawson 30	30	1571
STEPHENS COUNTY—		
Cox & Caprito, Donnell 1.....	30	3270
W. J. Rhodes et al, Black Bros. 1..	16	3342

*Failures; †Junked; ¶Million cu. ft. gas.

mile northwest of a small wildcat producer in Yoakum County, was coring at 5245 feet, with an elevation of 3669 feet. First saturation was logged at 5204-14 feet.

Gas Hinders Duggan Completion

Completion gauge on P. N. Wiggins, C. Ed Hyde et al's Slaughter 1, 4-mile northwest extension for the Duggan pool, Cochran County, has been hindered by gas-locked pumping equipment. The well is capable of about 400 barrels daily, according to owners, but lacks sufficient gas to flow natural, but the free gas interferes with the working barrel. Flow valves may be tried as a solution to the difficulty, else the hole may be deepened from 5020 feet. The same group's Slaughter-Dean-Honolulu 1, three miles north and one mile east of the Duggan discovery, has cemented pipe at 4800 feet, and is slightly higher on structure.

The Texas Company's Slaughter 1, Cochran County wildcat, encountered increase in sulphur water in drilling to 4967 feet, or 1159 feet sub-sea, and has plugged back to 4882 feet to test small show of oil passed up.

Another wildcat failure for Hockley County was evident last week when Frank Bates et al's Lockett 1, PSL Section 5, Block 1, filled 250 feet with sulphur water at 5260 feet. Top of first lime was logged at 3990 feet, with an elevation of 3453 feet.

The Texas Company's Bob Slaughter 2, third test assigned to the Slaughter pool, southwestern Hockley County, has been shifted to the SE C of Labor 92, League 37, midway between the company's discovery and recent completion by Stanolind Oil & Gas Company.

NORTH TEXAS
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ARCHER COUNTY—		
M. Staniforth et al, T.B. Wilson 17-A	*	1623
COOKE COUNTY—		
Benton & Holmes, H. Y. Gibson 1..	*	3830
Bridwell Oil Co., J. R. Parkey 6..	20	689
T. P. Frost et al, Rohmer 5.....	7	865
Pace Pet. Co., R. E. Aldridge 11..	150	1104
Schermerhorn Oil Corp., M. Kessler 11	110	1327
Frank Schoonover et al, Ed. Wilson 3	500	1930
Seitz-Comegys & Seitz, W. A. Erwin 1	*	1653
DENTON COUNTY—		
Sin-Tex Oil Co., E. W. Forrester 1, blk 17	10	1763
JACK COUNTY—		
Burk Roy. Co., S. M. Jones 3.....	336	3162
Cockburn Oil Co., J. M. Box 3....	381	3170
Moncrief & Showers, J. M. Box 3	267	3252
MONTAGUE COUNTY—		
Bridwell Oil Co., Cunningham 3-D..	*	1339
Gibson-Jennings, Inc.-Sinclair Prairie, Holt 19	160	1760
WICHITA COUNTY—		
J. K. Bailey et al, W. D. McClure 13-A	*	1960
Deep Oil Dev. Co. First Nat'l Bank 3	750	3804
First Nat'l Bank 4.....	525	3840
Morgen & Anderson, K. T. Goetze 2	*	907
WILBARGER COUNTY—		
Baker & Camp, Tr., Waggoner Est. 3-C	*	1146
Golding & Cochran, Waggoner Est. 1-R	*	3564
Phillips, Waggoner Est. 1-LLL....	30	2271
YOUNG COUNTY—		
F. W. Bennett et al, J. H. Robinson 1	224	3638
Chambers & Hanks, E. A. Edwards 1	*	950
Christie Bros. et al, E. H. Morrison 1	15	3868
T. D. Humphrey et al, E. F. Shields 1	2000	3920
C. A. Lupton & J. McLester, Medlin 3	346	3372
Sams & Watson, F. M. Cullers 2..	25	575

*Failures; †Junked; ¶Million cu. ft. gas.

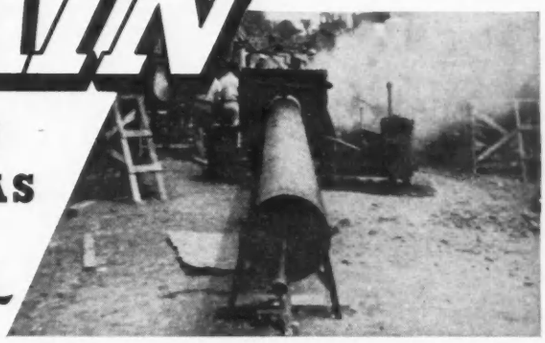
TEXAS PANHANDLE
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CARSON COUNTY—		
Cities Service, W. H. Fuqua 7....¶11.04		3041
Sinclair Prairie, E. Cooper 9.....	253	3081
E. W. Means et al, H. B. Price 1..	*	3224
GRAY COUNTY—		
Cities Service Oil Co., W. C. Archer 6-C	539	3275
Gulf Oil Corp., S. Faulkner 9-A....	357	2921
Stanolind, Cobb 12-B	513	3335
Stanolind-British American O. P. Co., Holmes 6	111	3275
HUTCHINSON COUNTY—		
J. E. Crosbie, Inc., H. W. Pitts 24..	628	2858
McIlroy & Herrmann, Haile 5.....	908	3076
Phillips Pet. Co., J. J. Perkins 13..	364	3030
Shell-Sinclair Prairie, O. Phillips 1-A	¶21.4	3205
The Texas Co., J. W. Moore 7, sec 21	339	3147
Travelers Oil Co., W. B. Haile 3-B	860	3039
MOORE COUNTY—		
Continental Oil Co., J. C. Phillips 1.	¶58.7	3095
Magnolia, E. C. Brittian 5.....	¶75	3300
Phillips Pet. Co., W. Coffee 1.....	¶74.5	3320
Home Gas Co. 1.....	¶82	3250
T. J. Nunley 1	¶98.3	3050
Test-Brumley-Sturdy 1	¶136.5	3549
Texas 1, sec 193.....	¶62.1	3190
R. H. Venable-Morton 1.....	¶60.4	3255
Shell & Sinclair Prairie, W. L. Russell 1	¶13.1	3200

*Failures; †Junked; ¶Million cu. ft. gas.

AGAIN

NORTHERN NATURAL GAS selects



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WEST TEXAS

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ANDREWS COUNTY (Fuhrman)—		
Fuhrman Pet. Corp., W. H. Bones 7-B	491	4488
ANDREWS COUNTY (Means)—		
Humble, J. S. Means 29	605	4526
CRANE COUNTY (Jordan)—		
Texas Co., University 1-D-a	11,567	3538
CRANE COUNTY (McCamey)—		
Anderson Oil Co.-D. D. Thomas, N. N. Durham 1	10	2550
Ennis-Crane Prod. Corp., Hughes 4-B	948	2075
Hildebrandt & Lemmons, Hughes 1.	*	2495
CRANE COUNTY (Sand Hills)—		
Gulf-Cranfill Bros., Tubb 11	2106	4420
CRANE COUNTY (Waddell)—		
Gulf, W. N. Waddell 19	6360	3502
ECTOR COUNTY (Foster)—		
Broderick & Calvert, J. E. Witcher 1.	555	4326
Amon G. Carter et al, J. L. Johnson 6	638	4200
Cities Service, J. E. Gagley 2	425	4250
Sinclair Prairie, D. A. Johnson 1	661	4265
Stanolind, J. L. Johnson 3	293	4230
J. L. Johnson 4	108	4235
ECTOR COUNTY (Goldsmith)—		
Devonian Oil Co., Scharbauer 3-C.	568	4220
Gulf, C. A. Goldsmith 38	812	4205
C. A. Goldsmith 39	1872	4220
C. A. Goldsmith 42	2076	4215
C. A. Goldsmith 43	4476	4235
Humble, C. Scharbauer 4-B	645	4245
Landreth Prod. Corp., C. Scharbauer 4-B	1888	4196
Pure-Phillips, C. Cowden 14	4213	4165
C. Cowden 15	1680	4160
Shasta Oil Co., C. Scharbauer 1-D.	256	4203
Sinclair Prairie, R. L. Cummins 1.	5	4248
ECTOR COUNTY (Judkins)—		
E. E. Fogelson et al, University 1-A, sec 4	532	3628
Gulf, W. E. Connell 2-A	366	3700
FISHER COUNTY (Rotan)—		
Montour Prod. Co., E. Smith 1	7500	3559
GAINES COUNTY (Wildcat)—		
Amerada, C. M. Armstrong 1	*	5079
JONES COUNTY—		
Bridwell Oil Co.-L. Fikes, Jennings 9	151	2053
Brown Eagle Oil Co.-Fain McGaha Oil Corp., W. Glaze 1	*	2505
Brown Eagle Oil Co.-S. B. Roberts Co., Guitar 2	630	2001
Guitar 3	497	2002
W. S. Lewis 5	503	2001
E. P. Campbell et al, S. A. Kelley 1.	12	2251
W. R. Minter Est 1	*	2524
E. P. Campbell & Hoover, Holt-Swenson 1	*	2012
Danciger, Guitar 8	458	2007
Joe DuPree et al, E. Jackson 3	392	2002
Fain-McGaha Oil Corp., J. S. Akens 1	*	2140
R. B. Farris, L. Fikes & Ungren-Frazier, Guitar 11	175	2007
Guitar Trust Est., fee 8	650	2004
Fee 9	338	2002
S. C. Herring-J. E. Childers et al, H. C. Jackson 2	600	2004
Iron Mt. Oil Co.-Humble, H. B. Haterius 1	3300	3246
Lewis Prod. Co., H. Sayles 6	293	1986
N. H. Martin & Son, H. Dorsey 11-A	63	2166
N. H. Martin & S. G. Hodges, Mrs. W. Gilbreath 1	*	2270
Owen M. Murray & L. C. Harrison, Little-Aikin 1	*	3515
W. J. Murray, Jr., et al, E. Jackson 1	18	1998
S. B. Owens et al, Mrs. W. Gilbreath 2	565	2003
W. H. Peckham et al, W. Davis 1.	*	2085
Pet. Producers Co., H. C. Harvey 5.	20	1642
R. J. Reinke et al, Blackwell 1	*	1420
Sinclair Prairie, B. King-Dorsey 9-B.	293	2218
Ungren & Frazier, G. W. Harvey 1.	*	2192
E. H. Melton 1	*	2525
Ungren-Frazier & Ambassador Oil Corp., S. A. Kelly 1	146	2027
PECOS COUNTY (Torborg)—		
Cardinal Oil Co., M. A. Smith 16-A.	8	370
Paul Childress, Tr., Smith-Sinco 21.	10	410
PECOS COUNTY (Yates)—		
Ohio, I. G. Yates 17-D	66,192	1378
W.R.A.B. Oil Co., I. G. Yates 1.	75	1664
TERRY COUNTY—		
Anthony-Rice & Illinois Oil Co., Brownfield 1	*	5340
R. L. Foree et al, A. E. Poole 1	*	5507
UPTON COUNTY (Gulf-McElroy)—		
Gulf, J. T. McElroy 158	369	2874
UPTON COUNTY (McCamey)—		
Anderson Oil Co., D. Elder 2	538	2410
Basin Oil Properties, Baker-Gulf 2-B.	1017	2401
Baker-Gulf 4-B	1037	2361
Cardinal Oil Co., Starnes-Fowler 6.	707	2291
Bert Fields et al, A. Gibbs-Conoco 12	750	2317
Gulf, E. S. Hughes 6	80	2135
G. H. Rogers 8	227	2249
Homestead O&G Co., Hughes-Pure 7	790	2731
Sid W. Richardson et al, G. M. Harlan 2	557	2140
Sergent-Rutter & Wilbanks, Elder 3.	842	2258
Snowden & McSweeney Co., Hughes 7	82	2336
T. P. Coal & Oil Co., J. Lane 3-B.	273	2190
WARD COUNTY—		
Bentley-Massey & Irwin, Boogher-Shell 1	*	2300
Clark-Mayfield & Aldrich, F. C. Green-Sun 2	642	2347
Gulf, E. W. Estes 55	530	2620
Hutchings 87	1344	2735
Humble, L. Richter 19	919	2930
Johnson & Morrison, M. J. Cummins 1	123	2219
Sinclair Prairie, H. Archenhold 10.	120	3030
Texas Co., University 1-B	*	3072
WINKLER COUNTY (Emperor)—		
Emperor Oil Co., Halley-Woodley 3-B	1004	2897
WINKLER COUNTY (Halley)—		
Eastland Oil Co., Halley-Amerada 5-A	414	2910
Skelly, S. M. Halley 21	545	2910
WINKLER COUNTY (Henderson)—		
W. K. Royalty Co., Walton-Humble 1-D	562	3030
WINKLER COUNTY (Permit)		
Gulf, O. Clapp 16	384	3110
O. Clapp 17	304	3110
L. Daugherty 63	1529	3020
WINKLER COUNTY (Keystone)—		
A. G. Carter et al, Walton-Pure 13.	198	3365
YOAKUM COUNTY—		
Moore Bros. Corp., Geo. Cleveland-Ohio 1	*	5506

*Failures; †Junked; ¶Million cu. ft. gas.

Dead well canvass starts big reconditioning campaign

Kilgore.—Canvass of the East Texas field for dormant wells undertaken by the Texas Railroad Commission September 28 has boosted the total number of accounted for dead wells to 70, according to a midweek tabulation. Heretofore, the total has varied from 45 to 60 on each daily proration report during the past year, or more.

The field-wide search was preceded by ample warning, and property owners have launched the greatest well "conditioning" campaign in the history of the field. Dead wells that are in process of being worked over have not been officially classed as dormant producers.

Accounted for sub-marginal wells on October 1 totaled 213. These wells are not capable of producing the minimum quota of 20 barrels daily. The commission's field staff is conducting 24-hour production gauges on a number of wells that have been reported to be incapable of making their 20-barrel allowable.

Release of large batches of drilling permits the past week forecasts a continuation of field operations on a large scale. Late survey reveals 89 rigs in service, and there were 58 completions the past week, including a failure and a junked test. Permits for the drilling of additional wells on tracts of less than one acre were listed among the latest authorizations by the commission.

Wichita Falls, Texas.—Expansion of the K-M-A deep lime area 5 miles south into northern Archer County looks promising for W. H. Hammon, Hanlon-Buchanan, Inc., et al's W. P. Ferguson 1, near north line of Section 2, H&GN-E. Patterson Survey A-1179. Sand and sandy-lime, carrying oil saturation, was logged at 3967-3990 feet, and operations halted to cement 7-inch pipe at 3900 feet and complete with machine. This outpost is several locations southwest of Shappell Oil Company's Ferguson 2, which was completed August, 1931, in water sand at 4006 feet after logging oil and gas showings in the Strawn horizon.

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EAST TEXAS

Opelika Trinity production prospects are renewed.

* * *

Mexia test first to pass through Travis Peak stratum.

Tyler, Texas.—Renewed prospects of production being found in the lower Trinity series by the second test on the Opelika structure, Henderson County, arose when Tide Water Associated Oil Company et al's McElreath-Suggett 2-C recovered 2½ feet of sandstone, carrying distillate taste and odor, in last core pulled at 9320 feet. The test is in the Travis Peak Section. A production test will be attempted through drill pipe. The group's McElreath-Suggett 1-C, 880 feet northwest, continued to flow 6 to 8 barrels of high gravity oil daily through partially clogged and junked hole at 7195 feet, from a stray lime zone between the anhydrite sections. The latter precipitated a lease and royalty play of considerable proportions, and values were deflated when the second project failed to produce in the 7195-foot zone and also the lower Glen Rose series entered at 7712 feet, with an elevation of 452 feet.

Passes Through Travis Peak

Lower Marine zone, potential source of production for the Mexia faulted field, Limestone County, has been penetrated 337 feet by Pure Oil Company's Kendick 16 in drilling to 8012 feet. No shows that warrant production tests have been recorded. This is the first test in the main section of the East Texas Woodbine basin to drill through the Travis Peak series, which were topped at 5656 feet, with an elevation of 520 feet, and proved to be 2020 feet thick. Heretofore, geologists have speculated as to whether the formation underlying the Travis Peak would be of an impervious character. Kendrick 16 has revealed that this lower zone is made up of sandy-lime and shales, and may produce elsewhere in the basin. Stanolind Oil & Gas Company and Ramsey Petroleum Corporation's Norris 1, located on the Thornton fault, Limestone County, was drilling in lime at 3820 feet.

Humble Oil & Refining Company and Gulf Oil Corporation's E. D. Robertson 1, first Trinity test for the east flank of the East Texas field, was drilling in lime and shale at 5460 feet.

High structural position on the Georgetown lime has been recorded by Humble Oil & Refining Company's Southern Pine Lumber Company 5-A, located on 210-acre lease, John Morton Survey, 2 miles northeast of Jarvis, Anderson County, Top of lime was called by driller at 5047 feet, or 4708 feet sub sea, and protection string of 9⅝-inch pipe was cemented at 5101 feet. Barnsdall Oil Company et al's H. C. Swanson 1, about ¾-mile northeast of Jarvis, logged top of Georgetown at 5215 feet, or 4885 feet below sea level, and shut down last June after cementing pipe at 5245 feet.

Henderson County has two wildcats seeking production in the lower Trinity. American Liberty Oil Company and E. B. LaRue's Johnson 1, located near the LaRue salt dome, was drilling at 6950 feet, having topped the Georgetown lime at 5520 feet. Sherman Hunt, DeArman & McMillan's A. R. Dilard 1, located in the northwest part of the county and on the Mexia fault trend, was drilling at 4080 feet in lime, topped at 3725 feet.

E. H. Moore, Inc.'s Chronister Lumber Company 1, John Durst Survey, 3 miles northeast of Wells, Cherokee County, was drilling at 1050 feet. It is in the southeast part of the county, and is seeking production from the Woodbine.

Small percentage of oil with salt water spray was tested by American Liberty Oil Company's J. A. Bean 2, 2200 feet east of its discovery gasser in the Grapeland pool, Houston County, after perforating pipe at 6070-74 feet. The well makes 2,500,000 feet of gas daily while testing through tubing choke. Top of Woodbine series was logged at 6069 feet, with an elevation of 515 feet, resulting in a lower structural position than the discovery.

EAST TEXAS
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
JOINER AREA—		
R. H. Dearing & Son, R. McDavid 8 (78.6-ac)	120	3714
Geo. Despot & T. C. Adams, D. J. Deason 3 (5-ac)	4200	3684
G. B. R. Oil Corp., L. Harmon 18 (26.87-ac)	8300	3736
Gulf, Jack Wiley 14 (100-ac)	8000	3721
Haynes Oil Corp., T. J. Brown 11 (40-ac)	7800	3739
Humble, A. D. Blackwell 56 (325.79-ac)	8500	3647
A. D. Blackwell 57 (325.79-ac)	8300	3623
J. H. Silvey 20-A (142.85-ac)	7000	3728
R. E. L. Silvey 58-A (460.56-ac)	9000	3742
Hunt Oil Co., Ashby 16 (99-ac)	240	3642
R. W. Fair 35-C (211.4-ac)	9500	3631
Martex Oils, Inc., Mayfield 47 (197.1-ac)	6500	3716
Gordon McMillan, Tr., M. A. Thrash 4 (13.4-ac)	7200	3774
McMurrey Pet. Corp., G. A. Turner 32 (195.63-ac)	6500	3810
Octo Oil Corp., J. F. Cox 4-B-a (10-ac)	3500	3645
Ohio, J. F. Mason 16 (103.86-ac)	3600	3644
Spandsco O&R Co., E. B. Alford 2 (5-ac)	240	3605
Standard (Kan.), Kangerga 4 (20-ac)	9800	3671
Texas Co., J. W. Wilson 16 (138.64-ac)	2500	3656
Texas Gulf Pet. Co., Hodnett-Melton-Sun 21 (134.84-ac)	1500	3681
KILGORE AREA—		
J. S. Abercrombie-Harrison Oil Co., Brightwell 5-B (15-ac)	9000	3610
Luling O&G Co., W. P. Brightwell 8-B (21.84-ac)	9500	3643
Magnolia, M. Andrews 6 (54.36-ac)	8700	3606
Jess King 8 (33¾-ac)	4800	3661
Mose Mayfield 3 (22-ac)	*	3710
A. F. Sheppard 6 (422.99-ac)	2500	3573
M. W. McVey et al, K. Dickson-Alford 3, blk 137	4000	3537
Perot Oil Corp., J. L. McNeeley 8 (17½-ac)	3000	3620
Sinclair Prairie, H. J. Thomas 9 (65.38-ac)	1200	3718
Stanolind-Crosby, Ben Laird 8 (40-ac)	8300	3714
Stidham & Thrasher, B. D. Russell 3 (1.56-ac)	120	3522
Sun-Seaboard, M. T. Cole 52 (266.17-ac)	8200	3575
Tide Water, E. R. D. Bivens 34 (200-ac)	9300	3601
Sam K. Vierson et al, A. Givens 4 (12-ac)	9400	3631
LONGVIEW AREA—		
Atlantic, J. C. Judge 88-A (455-ac)	9700	3633
Atlantic-Sun, R. C. Barnsweli 9-C (51.33-ac)	9600	3550
Atlantic-W. K. Wadley, M. Turner 30 (161.57-ac)	10,000	3740
Bonds & Dillard Drl. Co., D. Meyer 10 (41½-ac)	9000	3580
Deep Rock Oil Corp., B. Jones 17 (61.12-ac)	10,200	3618
FHE Oil Co., B. C. Christian 21 (87-ac)	9500	3634
Gen'l American Oil Co., A. J. Sanders 20-A (73.63-ac)	†	2511
Gen'l Crude Oil Co., Barnswell 13 (50-ac)	8900	3501
Humble, A. L. Hughes 18 (90.8-ac)	10,300	3616
Magnolia, H. Hampton 18 (153.33-ac)	7200	3635
Pete H. Pewitt et al, O. J. Phillips 7 (118.6-ac)	600	3678
J. C. Porter 1 (66-ac)	2500	3722
J. C. Porter 2 (66-ac)	2500	3710
L. A. Williford 5 (133-ac)	750	3695
L. A. Williford 16 (133-ac)	750	3670
L. A. Williford 2-B (5-ac)	1500	3791
E. L. Smith Oil Co., J. W. Harrison 4 (15-ac)	10,500	3567
Stanolind, F. K. Lathrop 28-B (114.8-ac)	3600	3612
S. G. & M. Smith 13-B (80.56-ac)	7200	3510
Stanolind-Tide Water-Conoco, Flewellen 16-A (200-ac)	500	3708
Sun, D. G. Sparks 6 (50-ac)	3600	3673
Texas Canadian Oil Corp., O. M. Victory 15-B (68.7-ac)	4500	3682
O. M. Victory 16-B (68.7-ac)	4300	3675
Tide Water-Stanolind, A. J. Tuttle 17 (95.8-ac)	9500	3570
ANDERSON COUNTY (Cayuga)—		
Tide Water-Seaboard, Ware 13 (571.65-ac)	2000	4103
FRANKLIN COUNTY (Talco)—		
Humble, Norman-Prince 2 (127.67-ac)	368	4312
Stroube & Stroube, J. A. Hedrick 2 (65-ac)	500	4300
Texas Co., H. C. Barker 5 (468.39-ac)	130	4272
HENDERSON COUNTY (Cayuga)—		
Joe A. Worsham et al, J. & J. Wathen 4 (62-ac)	3600	4091
TITUS COUNTY (Talco)—		
G. M. W. Oil Co., Edwards 6 (20-ac)	360	4312
Housh & Thompson, Inc., L. Blackburn 4 (33 1/3-ac)	480	4300
Humble, H. C. Fry 5 (87-ac)	240	4300
Lucey Pet. Co., I. N. Williams-Gulf 5 (32½-ac)	433	4298
Tysco Oil Co.-Yeager et al, Edwards 2-A (20-ac)	270	4285
BOWIE COUNTY—		
Russell, McGuire, F. T. Chew et al, B. Barkinson 1 (90-ac)	*	2881
MORRIS COUNTY—		
Joiner Oil Corp., M. Sheppard 1	*	4502
CASS COUNTY (Rodessa)—		
Union Prod. Co., Allday 4, Priscilla Evans sur	61	6016
Starcke A-1, D. Gilliam sur	40	6050
MARION COUNTY (Rodessa)—		
Shell, Henderson 1, R. Bennington sur	534	6013
HARRISON COUNTY—		
J. B. Bond, Martin 1, Bailey & Martin sur	*	6518

*Failures; †Junked; ¶Million cu. ft. gas.

SOUTHWEST TEXAS

More tests announced in big deep wildcat campaign.

* * *

Second Austin Chalk field discovered in Frio County.

Corpus Christi.—McFaddin, Victoria County, bids for the position as the first ranking oil field of the South Texas Gulf Coast with a second Greta sand producing area virtually assured as a result of the coring of oil and gas sand at 4477-4505 feet in Transwestern Oil Company's A. M. McFaddin Estate 1-A, a deepening job. The sand is in the Hetrostegina, and corresponds to the Greta sand.

A drill-stem test was run of the last six feet, where six percent oil saturation was encountered, but the seat slipped. A second test then was being attempted.

The test is 5000 feet from the southeast line of the Jules Vairin Survey and 4500 feet west of the Guadalupe River, a southwest offset to Shell Petroleum Corporation's McFaddin test. It originally was completed at 3512 feet and deepened to the new sand.

This well is 5½ miles northeast of Transwestern Oil Company's McFaddin 1-E, completed recently in the same sand as an oil producer. Despite the fact that they are in the same horizon, the two wells are believed to be on entirely separate local structures on the main McFaddin structure covering some 20,000 acres. The discovery, however, is looked upon as being important with several prolific producing spots assured and other pools likely to result from further exploration.

South Texas is in the throes of the most extensive deep wildcatting campaign in history. A number of new locations were added to the list during the week in practically every county of the trend.

In Nueces County, John F. Camp is rigging up for C. P. Wardner 3, which is to be drilled to 7500 feet in effort to uncover deeper sands in the Stratton pool. Union Producing Company has made location for A. B. Simmons 1, a deep test west of Banquette, and is coring below 7680 feet in T. S. Schroeder 1, in the Agua Dulce pool. Rivers 3-A, in the same field, was carried to 8452 feet, but plugged back and has been completed as an oil and gas well at 5680-90 feet. Texon Royalty Company is still testing around 6668 feet in an effort to open a deep sand in the South Dulce field.

In the Saxet field, Sutex Oil Company is cutting out liner to deepen L. M. Vance 5 to possibly 8000 feet or deeper. It is an old well bottomed at 7000 feet. Seaboard Oil Corporation's Luby 1, one mile northwest of the Luby field, is scheduled to go to at least 7300 feet, now progressing below surface casing. Heep Oil Corporation's deep test on the Ollie Purl land in Auga Dulce field is nearing 6000 feet, while L. M. Lockhart's Ollie Purl 1 plugged back to 6300 feet after drilling to 7392 feet.

Plan 2 to 11,000 Feet

Union Producing Company's deep operations at Agua Dulce and at Refugio are unusually interesting and important. Rumors are that this company will drill two wells to at least 11,000 feet, one apiece for the above areas. The company recently drilled a 9000-foot test at Refugio and plugged back to open a sand below 7000 feet. Fred Shields and W. L. Pearson each have active operations on the Ryals land in an effort to pick up the sands below 7000 feet productive in the Union Producing Company test. The latter concern has a well on the Phil Power land drilling to the lower levels of the Refugio field and another on the Fox land in the Greta field, which is progressing below 6900 feet.

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San Patricio County added several, Rutherford Oil Corporation is completing a deal for a 7000-foot test near Gregory while Heep Oil Corporation's Welder 8-F in the Plymouth field has been plugged back to 6019 feet after drilling to 7246 feet. It will test sand at 5925 feet. H. J. Porter is drilling at a shallow depth on Schmalsteig 1, a deep test 4½ miles southeast of Sinton.

Aransas County's 7100-foot McCampbell field continues its active program with Atlantic Refining Company drilling one test to horizons below 8000 feet. It is now at 8015 feet. The well is L. L. Porterfield 1-C.

Victoria County has one test which will be highly interesting. Although no definite announcement has been made, it is understood that Union Oil Company of California will drill C. A. Keeran 7 to about 10,000 feet unless satisfactory production is found shallower.

Jackson County had a deep test staked by Magnolia Petroleum Company on the 12,000-acre West Ranch south of Vanderbilt. The well will be in the Ramon Musquiz Grant and will test the company's 15,000-acre block held for the past several years. This company set a 7-inch protection string of casing in A. A. Seeligson 7, southeastern Jim Wells County, after progressing to 6795 feet.

Jim Hogg County wildcat shows for big gas producer

Laredo.—Jim Hogg County drew Mirando district attention when Darby Petroleum Corporation set casing to complete Reubin Holbein 1-B, wildcat which is showing for a big wet gasser in the Cole sand at 1780-89 feet. It is 5 miles east of Henne, Winch and Fariss field, 14 miles west of Hebbronville, and is on strike with production in the Cole-O'Hern district of Duval and Webb counties, a prolific producing area in this sand and deeper zones.

The potential producer is in the northwest corner of Lot 5, Section 7, Holbein Subdivision of Las Animas Grant, Share 3, and is in a block of 4000 acres. Nearest protection is ½ mile to the east and is under lease to the Humble Oil & Refining Company.

The test showed a slight bit of oil on cores, but on a drill-stem test of 1 minute 45 seconds duration through ½ bottom and ⅜-inch choke, developed 320 pounds pressure, then attempted to blow out through leaks around the fittings. It was killed and casing set on bottom. The test likely will core ahead in an effort to find oil saturation.

This district has been well explored, and a large structure has been mapped from the numerous tests drilled. There is room, however, for a fairly large Mirando-type oil field on this structure.

Rancho Solo Extended

Along the same trend, but in Duval County, Cox & Hamon extended Cole sand production in the Rancho Solo field 1½ miles to the northeast through completion of W. R. Peters 1, which flowed 2 barrels of crude per hour with considerable gas. The well was being connected into separators late in the week, so a definite gauge will be delayed several days. The test, in southwest corner Section 32, drilled to 1898 feet, plugged back to 1835 feet,

and was completed in a 7-foot section, casing having been set at 1831 feet.

Adams & Lefevre's E. Garcia 1, probable discovery well of a shallow Mirando sand area in Webb County, 3 miles southeast of Mirando City, recemented after first cement job gave way. It will drill out plugs over the week-end and complete through perforations at 1860-66 feet.

Plugs had been drilled and preparations were being made for a production test on E. J. Pearl et al's De la Garza Estate 2, 2 miles northeast of the Caroline-Texas field, Webb County, which cored oil sand at 2100-7 feet and drilled to 2110 feet in the Mirando sand. It may open an entirely new pool for the district or extend the productive area.

Several minor extensions were provided to the Oilton-Killam district, further closing in the producing gas between these two areas.

In Duval County, North Sweden production definitely was defined to the northeast by Sun Oil Company's F. S. Barton 1, northeasterly outpost, which is drilling ahead to the Pettus sand below 5100 feet. It showed no odor in a sandy section at 4794-4804 feet, salt water at 4934-56 feet, and again at 5010½-26½ feet. This test is supposed to be about 100 feet lower structurally than the west offset, indicating a cross fault at this point, which may extend in a northwesterly direction and be a definite limit to the field.

Edwin M. Jones is completing gathering system, pipe line to railroad siding at Kittie, and pumping unit for wells in the Ezzell field of McMullen and Live Oak counties.

Another field in Bee County; DeWitt-Live Oak active again

Beeville.—Another small Hockleyensis sand field in Bee County was uncovered by J. R. Daugherty's R. T. Hicks Estate 3, southwest of Normanna, which was in final stages of completion as the week closed. The well recovered 100 feet of oil, 80 feet of muddy oil, and developed 12 pounds pressure in 8 minutes through ¼ and ⅜-inch chokes at 3657-70 feet. The hole was deepened 4 feet and pipe set at 3662 feet. Sand section was encountered 3663-74 feet.

The discovery well is 1000 feet west and 150 feet north of the southeast corner of Block 39, J. M. Uranga Grant.

A revival of wildcatting, especially in DeWitt and Live Oak counties, has been evidenced during the past several weeks. This play is nearing the peak of a year ago when efforts were being made to open new producing spots on trend with present areas.

Frio County Austin chalk well is on big acreage block

San Antonio.—Frio County's second Austin chalk field was discovered by H. A. Pagenkopf and L. C. Jamieson in their second wildcat on a block of acreage in the northwestern portion of the county. Gauge was being run in Houston Estate 1, discovery well, which found the Austin chalk at 2592-2651 feet and set casing at 2579 feet. Elevation is 631 feet.

The tubing was run to within 139 feet of bottom and the hole swabbed 10 times when it came in. It made a head 20 feet above the derrick and was then turned into the tanks, flowing an estimated 25 barrels of 32.4 gravity oil per hour through the open tubing. This gravity likely will be increased after it flows several days.

The discovery is 1550 feet from the northwest line and 4036 feet northeast line of 2254-acre tract in the Juan Figuerroa Survey No. 151, about 6700 feet east of Frio River and 5575 feet east and south of Blackaller 1, drilled recently by these operators.

It is on an entirely new trend for South Texas and may lead to the drilling of a number of wildcats through the area in search of this type of production. It is several hundred feet up dip from the production by Wilcox Oil & Gas Company at Batesville in Zavalla County, southwest of the new field, and is 2700 feet up dip from the Pearsall field to the south.

This is the second discovery within a few days in the Cretaceous district southwest of San Antonio. The other was Wellington Oil Company of Delaware's Chittim Ranch producer in the Edwards limestone at 3256-87 feet, which is now being placed on pump. The well, located on a 375,000-acre block, and just east of the Chittim field, flowed at the rate of about 11½ barrels of 42.5 gravity oil per hour, but pressure was insufficient to allow it to flow steadily. Texas Gas Utilities Company is preparing to rework its several Glenrose producers at 5600-5800 feet, these

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wells being just west of the above oil well.

Deep Try to Plug Back

Amerada Petroleum Corporation's Halff & Oppenheimer 8, in the Pearsall field, Frio County, is waiting on orders to plug back to Edwards limestone topped at 6219 feet. It drilled to 10,741½ feet without results, to be the deepest ever drilled in South Texas.

In Atascosa County and 4½ miles north of Charlotte, Brown & Bell were drilling below 5000 feet in G. C. Atkins 1, which found a showing of oil at 4642-61 feet in the Taylor marl.

B. C. Armstrong's attempt to open a new oil pool north of Luling, Caldwell County, in the Austin chalk, is meeting with only nominal results. The test, in S. Seal Survey, topped chalk at 2407 feet, drilled in 40 feet, was acidized with 2000 gallons, then pumped 18 barrels of oil per day.

Another deep test for Valley; planned to go to 7500 feet

Mission.—Rio Grande Valley's deep drilling program had another wildcat location added to its list by H. J. Porter et al's Watson 1, to be drilled 7 miles southwest of Weslaco in Hidalgo County. The definite location has not been announced, but is said to be on the Watson land. Both Humble Oil & Refining Company and Magnolia Petroleum Company are participating in the deal which will result in a 7500-foot operation.

Atlantic Refining Company was below 4425 feet in American 1, 2½ miles southwest of Weslaco, Hidalgo County. Davenport et al's Hidalgo 1, in the La Blanca area, was below 6265 feet, while Swallow 1-A was preparing to drill plugs after coring the deep sand at 7928-7918 feet, drilling to 7939 feet and

[*Continued on page 294*]

SOUTH TEXAS
Completions

SAN ANTONIO DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
BASTROP COUNTY—		
H. & H. Drilling Co., Earl C. Erhard 1, Lewis Estill 100-ac tr, Knight & White league, Hills Prairie Community	*	3639
BEXAR COUNTY—		
R. P. Whitfield & Gus Draper, G. Ickey 1, 154-ac tr, Tom Gortaris sur 5	*	1027
CALDWELL COUNTY—		
B. C. Armstrong et al, Wilson Bell est 1, 85-ac tr, S. Seal sur	180	2447
W. B. Johnson Drilling Co., Lockhart State Bank et al 1, John Roe sure, (Branyon)	167	2193
Lanning & Coffield, W. R. Trammell 1, 36-ac tr, Guadalupe College sur, (Luling)	10	2276
Potter & Snowden, Inc., W. W. McCrory 3, J. A. Neil sur (Branyon)	50	2265
GUADALUPE COUNTY—		
Mason Altgelt, Herman Schubert 1, 63-ac tr, Esnaurizar sur	*	1081
Diamond Half Oil Corp., Willie 1, Jacob C. Darst sur, (Darst Creek)	135	2633
Forest Dev. Corp., Hoffman 2, Sowell sur (Zoboroski)	110	2220
MAVERICK COUNTY—		
Rio Dev. Co., P. W. Thompson est 1, 6000-ac tr, sur No. 5, blk 16, Garcia sur	*	807
TRAVIS COUNTY—		
J. E. Robertson et al, Buck Christian 4, J. P. Kemp sur (Manda)	110	730
WILLIAMSON COUNTY—		
Thomas W. Davis Jr., Fee 1, T. H. Boggus sur (Byersville)	*	1291

CORPUS CHRISTI DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
ARANSAS COUNTY—		
Atlantic, Porterfield 3-B, lot 8, blk 11, (McCampbell)	600	7135
BROOKS COUNTY—		
Standard of Texas, Mestina (lse 1), R. G. Salinas sur, La Mestina de Gonzalina gr	275	2464
CALHOUN COUNTY—		
Al Buchanan & Blanco Oil Co., Mosris-Dunwoody 2, Agaton Sisneros sur (Heyser)	475	5494
KARNES COUNTY—		
Dirks Bros., E. Ruhmann 5, James Johnson sur, (S. Burnell)	650	3618
LIVE OAK COUNTY—		
Mills Bennett Prod. Co., Watson & Shipp 2, P. Salinas sur (Fort Merrill)	*	4851
F. D. Salter et al, I. W. Griffith 3, M. McGowen ranch sec 20 (N. Jacob)	*	910
NUECES COUNTY—		
Camp Prod. Co., C. Phillip Wardner 1-A, sec 18, C. E. Stratton subd, Paso Ancho Abajo & Paso Ancho Ariba surs, (Stratton)	240	6521
Humble-Barnsdall, Charles Brett et al 1, lot 1, blk 48 (Flour Bluff)	500	6668
Downey 1, lot 18, blk 48 (Saxet)	500	6666
Elizabeth Roberdeau et al 5, lot 4, blk 49, (Flour Bluff)	500	6663
W. R. Swan 2, lot 2, blk 54, (Flour Bluff)	450	6672
O. W. Killam, Ellick 3, Pauls subd, Driscoll Ranch (Clara Driscoll) (perf 3905-10)	90	3934
T. P. Morgan & Chapman Minerals, Rand Morgan-Clark 9, sec 405, (Saxet) Perf 6770-78	650	6945
Stanolind, G. H. McCann 2, Canutillo Colony Ditch Co. sur, (Luby)	450	5060½
United Prod. Corp., M. L. Rivers 3-A, Palo Alto gr, (Agua Dulce)	¶10 & 150	8452
REFUGIO COUNTY—		
Quintana Pet. Corp., Tom O'Connor 56-A, J. M. Swisher sur 5, (Tomoconnor)	1500	5928
Union Prod. Co., M. F. Lambert 64, Swisher sur 8, (Tomoconnor-Greta)	1200	5915
SAN PATRICIO COUNTY—		
Neill & Peterson, W. G. McCampbell Ranch 1-A, lot 1, blk 43 (McCampbell)	650	7116
F. P. Schwab, H. A. Smith 1, 58.4-ac sec 16-A, Cubage & Miller subd of O'Connor Ranch, J. Hart & Sons gr	*	6505
VICTORIA COUNTY—		
Barnsdall & American Liberty, Pickering-Roos 24, S A & M G sur 5, (Placedo)	240	4758
Magnolia, O. M. Landers 2, J. E. Galban sur, (Heyser)	420	5747

LAREDO DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
DUVAL COUNTY—		
Arkansas, Mabel Rossi 6, sec 10, Sweden subd, Santos Flores gr (N. Sweden)	950	4775
Bridwell Oil Co., J. G. Anciro 3, blk 19, Sweden subd S. Flores gr (N. Sweden)	650	4781
Conservative Oil Co., DCRC (Sun) (Humble) 2, sur 47, (Colmena)	*	1505
Cox & Hamon, O. W. Greene 22, B S & F sur, (Hoffman)	80	2705
Frank J. Gravis, F. Vaello Puig 4-A, San Andres gr (N. Sweden)	500	4822
Navarro Oil Co., R. W. Owen 1-A, sec 19, S. Flores gr (N. Sweden)	475	4733
Standard Trust Co. 1, sec 41, C E P Irr & Mg sur	*	4521
Porter, Talbot and Dorn, A. Montemayor 1, 80-ac tr, Las Anacuas gr	*	5676
Reynosa Oil Co., F. G. Wilson et al, sec 9, Sweden sub Santos Flores gr (N. Sweden)	500	4776
F. G. Wilson et al 5, sec 9, Sweden subd, Santos Flores gr, (N. Sweden)	375	4776
Russ Pet. Co. et al, A. Farias 7, sec 9, Sweden subd, Santos Flores gr (N. Sweden)	650	4798
Standard of Kansas, Mabel Rossi 9, blk 10, Sweden subd, Agua Poquita gr (N. Sweden)	650	4796
E. R. Thomas Estate, E. V. de Pena 1, small sec 8	*	4610
JIM HOGG COUNTY—		
Henry M. Brown, Trustee, S. Gutierrez et al 1, sec 22, sh 4 of El Peyote gr, sur 579	*	3524
McMULLEN COUNTY—		
E. P. Tinney, Jerry Rutherford 1, blk 17 Two Rivers Ranch subd, Live Oak School Land sur	*	942
WEBB COUNTY—		
J. B. Blanchard et al, Laurell Bros. 2, sur 1006 (Oilton)	*	2025
Bridwell Oil Co., Maria G. Martin 5, sur 2167 (Oilton)	250	1933
French Oil Corp, J. G. Perez 2, sur 1007, (Killam)	100	1987
Gypsy, Maria G. Martin 12, sur 458, (Oilton)	175	1898
O. W. Killam, D. G. Garcia 5, sur 786, (Kallam)	75	2008
D. G. Garcia 23, sur 786 (Killam)	22	1988
Kirkwood & Morgan, H. G de Juarez 1, sur 1005, blk 23 (Oilton)	125	1944
Magnolia, J. G. Valdez 3, sur 754, (West Cole)	*	3808
Smith & Hamill, Maria G. Martin 7, sur 2167 (Oilton)	160	1897
ZAPATA COUNTY—		
E. Mayes et al, Adela G. de Flores 1, Dorothy sub. Charco Redondo gr, (Charco Redondo)	*	2515
B. W. Roscoe, C Bustamante 17, sh 33, Fansler Partition, Comitas gr (Escobas)	*	1418
Texas Co., Whitehead 107, Cerrito Blanco gr, (Escobas)	50	1262

*Failures; †Junked; ¶Million cu. ft. gas.

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TEXAS GULF COAST

Segno area test cores much sand in Saline Bayou.

* * *

Friendswood test plugs back from too much salt water.

Houston. — Gulf Oil Corporation's Wing 8, 2 miles south of production at Segno, Polk County, has cored more sand in the Upper and Lower Saline Bayou than any well in this portion of the country. Last week it was coring at 6300 feet in sand showing gas and distillate and has had continuous shows since it topped the Cockfield. It may be in the upper portion of the Cook Mountain, as the last marker was the Eponides Yegua at 5596 feet. Other wells producing oil from the Upper Saline Bayou in the Gulf Coast and also from Sparta in Cook Mountain, but it is believed no other well in the district has shown oil this deep in the Upper Saline Bayou.

Last week Wing 8 made a drill-stem test from 6258 to 6264 feet and recovered 600 feet of 44 gravity oil and 150 feet of distillate in 10 minutes through quarter-inch chokes with a 125-pound pressure. Another drillstem test from 6268 to 6269 feet recovered 6 thribbles of oil and 1 of oil and water. The hole is being carried deeper to explore. Already it is the deepest hole drilled at Segno which is producing from the Cockfield formation from 5100 to 5300 feet. Nineteen drill-stem tests have been made on Wing 8 and each has shown either oil, distillate, gas, and salt water. Hockleyensis was logged at 4515 feet, Cockfield at 5238 feet, Discorbis Yegua at 5382 feet, and Eponides Yegua at 5596 feet. Top of the gas sand was logged at 6259 feet.

Jack Frazier, the discoverer of the Segno field, drilled another dry hole in the area last week. Lynott & Buffam 1, west of the discovery well, was dry at 7797 feet. He made location for Lynott & Buffam B-1, 1254 feet east and 546 feet south of the northwest corner of the east 100-acres of the south half of a 912-acre tract in the J. Roberson Survey.

Gulf Oil Corporation announced its first location at Hardin. V. B. Hinson 1 is 330 feet north and 330 feet east of the southwest corner of a 62.5-acre tract in the H. B. Johnston Survey. Shell Petroleum Corporation is skidding derrick from Cochran 2 to a new location.

Humble Tries for Deep Oil at Devers

Humble Oil & Refining Company is trying for Saline Bayou and Cook Mountain oil at Devers, Liberty County. This is the first try below the Frio after finding salt water in that formation. The test, Sabine Tram 2, M. Whittington Survey, has cored nothing but salt water in Frio section.

At Labelle, Jefferson County, Sun Oil Company's Ward 1, showed dry gas last week. Tubing is being pulled to permit drilling a little more cement out before making another production test. It drilled to 10,147 feet and plugged back to 10,015 feet and screen was set at 10,005 feet. Tubing was run to 9152 feet. The well was washed in and showed a tubing pressure of 400 pounds and a casing pressure of 4200 pounds. After bleeding the gas off for two days the flow was killed.

Sun Oil Company's Jackson 1, Seabreeze, A. Ybarbo Survey, Chambers County, showed salt water after swabbing at 8835 feet.

In the northeast corner of Waller County, J. Bryan Eby et al made location for William Rice 1, 4800 feet west and 3125 feet south of the northeast corner of

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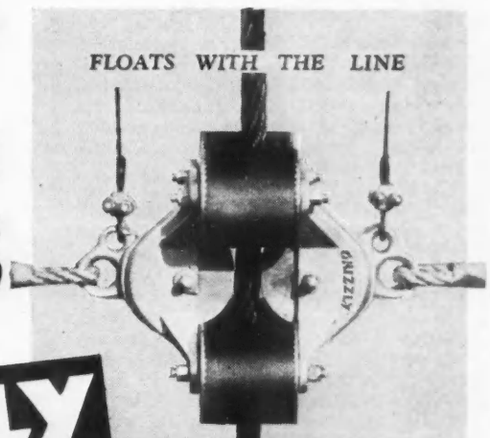

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the J. Stephens Survey. It is on the Waller prospect.

Hastings Extended North

Hastings was extended north last week when Pearland Oil Company completed Alexander 1, flowing 623 barrels of pipe line oil daily through a quarter-inch choke with a tubing pressure of 875 pounds and a casing pressure of 975 pounds from Frio sands at 6035 to 6070 feet. It was drilled to 6060 feet and casing perforated with 120 shots from 6035 to 6070 feet. Rig is being skidded for Alexander 2.

Hastings continues to be the most active field in the Gulf Coast. Stanolind Oil & Gas Company completed four wells there last week and has 10 at completion stages. Humble Oil & Refining Company and American Liberty Oil Company have wells down to the producing sand and should be completed next week.

Humble Oil & Refining Company recovered mostly salt water in Beamer 2, Friendswood, T. Choate Survey, Harris County, last week when a production test was made at 6100 feet. The hole was plugged back to 6040 feet and another test will be made. Location for Beamer 3 has been made.

Approximately 1½ miles from production at Friendswood, National Standard Oil Company made location for Coward 1, 350 feet southeast of the northwest line and 8560 feet southwest of the northeast line of Perry Austin Survey.

On the south flank of Withers field, Wharton County, The Texas Company completed Thompson 2, William Pettus Survey, flowing 169 barrels in 19 hours through a 3/16-inch choke from 5548 feet. The 25.9 gravity oil was flowing with a tubing pressure of 400 pounds and a casing pressure of 700 pounds.

Hardin Field Is Active

Hardin field, Liberty County, is becoming more active with each completion in the field. Two completions were announced last week and three new locations were made. Shell Petroleum Corporation completed L. Cochran 1, H. B. Johnston Survey, making 709 barrels daily through a quarter-inch choke with a tubing pressure of 975 pounds and a casing pressure of 1250 pounds from 7616 feet. The 38 gravity oil was flowing from sands topped at 7606 feet. Five-inch casing was set at 7603 feet.

TEXAS GULF COAST
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
AMELIA—		
Humble, Peveto 5	627	6783
Peveto 8	*	6812
BRENHAM—		
Virginia Oil Co., Kenieczny 4	*	509
DICKINSON—		
Bennett & Kenyon, Schroeder 2-B	37	8143
Humble, Maco Stewart A-4	720	8948
GOOSE CREEK—		
Bob Foster, Isenhour 1	*	2730
HARDIN—		
Jack Frazier, Lynott & Buffam 1-A	*	7797
Shell, Cochran 1	624	7616
HASTINGS—		
Pearland Oil Co., Alexander 1	623	6060
Stanolind, McKibben 4	589	6115
Shaw 9	600	5934
Sneed 11	602	6080
Surface 8	548	6080
HULL—		
Houston Oil Co., Texas Co., 3	*	5300
LOCHRIDGE—		
Gulf, Baker 3	648	6370
MARKHAM—		
Turman et al, Hudson 3	*	lcn.
SOUR LAKE—		
Texas Co., Fee 322	28	1793
WEST BEAUMONT—		
Stanolind, Sargle 7	105	5360
WILSON CREEK—		
United North & South, Goodyear 1	*	lcn.
Lambert 1	*	8660
WITHERS—		
Texas Co., Thompson 2	192	5548
Pierce Estate C-36	24	5553
FT. BEND COUNTY—		
Research Inc., Moore 1, ne of Orchard, S. Kennedy sur	*	7170
HARDIN COUNTY—		
Coronado Oil Co., Ryan 1, Hathaway area, J. G. Bell sur	*	5250
Humble, McShane 1, nec of county, S. R. Fisher sur	*	....
SAN JACINTO COUNTY—		
J. Mayo et al, Gibbs 1, ne of Oakhurst, L. Enriquez sur	*	1842

*Failures; †Junked; ¶Million cu. ft. gas.

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Another Deep Test

[*Continued from page 292*]

setting casing on bottom. Gulf States Oil Company was at a shallow depth on Delta Orchards 2, in the same area.

A new deep test for the north side of the Samfordyce field, Hidalgo County, was assured with Fohs Oil Company moving in for F. B. Guerra 1, Block 254, Porcion 40, to be drilled to below the regular sands of the field.

La Sal Viejo Oil Company was preparing to move in for Garcia 1, 8500-foot operation for Willacy County, 7 miles northwest of Raymondville. Two deep wells are at this time active in the county, Magnolia Petroleum Company drilling below 4020 feet in Armendiaz 1, and Shell Petroleum Corporation going ahead below 6400 feet in Yturria 2, both projected to at least 9000 feet.

Transwestern Oil Company's projected 8500-foot test on the Slick School tract in Survey 266, Star County, was going ahead below 6200 feet at last reports.

Alta Mesa field, Brooks County, was widened about 2700 feet to the southwest by Standard Oil Company of Texas' Mestina 9, which flowed at the rate of 275 barrels per day from 2450-64 feet.

Texas permits up

The Texas Railroad Commission approved last week permits for drilling 494 new wells in Texas, 180 more than were allowed the week before.

In the East Texas field there were 171 new locations, of which 88 were in Gregg County, 59 in Rusk County, 18 in Upshur County, and 5 in Smith County. The East Central Texas district reported 25 scattered locations.

There were 60 new permits in the West Texas district, including 21 in Upton County and 13 in Winkler County. The Panhandle area listed only 13 new permits.

North Texas reported 47 new locations, with 14 in Jack County and 14 in Young County. West Central Texas listed 27 permits.

The Gulf Coast area reported 99 new locations, including 39 in Brazoria County, 11 in Harris County, and 11 in Victoria County. There were 52 new locations reported in the Southwest Texas district, of which 10 were in Caldwell County and 23 in Duval County.

Texas August production

Indicated production for the month of August totaled 46,960,980 barrels, according to a report released last week by V. E. Cottingham, director of production for the Texas Railroad Commission. The total allowable for the month was 3,376,616 barrels higher than July production and averaged 1,514,870 barrels daily.

The total allowable for the month was 48,531,123 barrels, a daily average of 1,560,520 barrels. Indicated production was 1,570,143 barrels less than the allowable for the month.

The commission reported 1008 new wells producing in August, the total being 74,510 producing wells. This total included 30,153 wells which are flowing and 44,357 wells which are pumping.

Lease storage for the month increased only 137,496 barrels to 4,601,693 barrels.

Five interesting locations are announced.

* * *

Lafitte outpost cores sand below 12,000 feet.

Lake Charles.—Interest in Louisiana Gulf Coast last week centered around The Texas Company's State Bayou Norman 1, Section 28-17s-24e, ¾ mile east of production at Lafitte, Jefferson Parish. This well may become the world's first 12,000-foot producer, as a sand was cored from 12,009 to 12,030 feet that is said to look good. However, the test drilled ahead to 12,128 feet, where the drill pipe stuck.

If The Texas Company is successful in getting the 12,128 feet of pipe loose, the hole will be carried deeper. It is understood that the well will be drilled to 13,000 feet. If so it will establish a new world's deep drilling record.

While drilling at 12,069 feet, State Bayou Norman 1 tried to blow out and heavy drilling mud was pumped in the hole.

If State Bayou Norman 1 is a producer from the sands at 12,009 to 12,030 feet it will be a new sand for the field and also an extension. The well is reported to be in the Middle Oligocene formation.

North of production at Lafitte, The Texas Company's Madison Realty 2, Section 20-17s-24e, was making a production test last week. The well was drilled to 10,120 feet in broken sand showing oil. Top of the broken formation was logged at 9993 feet and top of the solid sand was encountered at 10,055 to 10,120 feet.

Two potential discovery wells in Lafourche Parish were drilling ahead last week. On the Raceland prospect, American Petroleum Corporation and Louisiana Land & Exploration Company's South Coast 1, Section 34-15s-19e, was down to 8264 feet in shale. It has not set casing yet, the plan being to carry the well down before running a protection string. South Coast 1 cored sand showing oil at 7238 to 7276 feet.

In the Timbalier Bay area, Gulf Oil Corporation's State PP 3, Section 36-23s-21e, was straightening hole at 7250 feet before drilling deeper. The well will search deeper for new sands other than the ones already encountered at 6748 and 6955 feet. The well on two drill stem tests has shown it would produce commercial oil.

William Helis' City of New Orleans 2, Marchland salt dome, Section 19-23s-

SOUTH LOUISIANA Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CHOCTAW—		
Standard Oil Co., Gay 7	613	4694
ENGLISH BAYOU—		
Union Sulphur, Castle 8	47	5159
JEANERETTE—		
Herton Oil Co., Roanes 5	*	8105
JENNINGS—		
Austin B. Taylor, Lake Oil Co. 1	384	3601
NEW IBERIA—		
Texas Co., Gralino 3	¶1½	5078
Bryant 3	*	4102
POTASH—		
Humble, Orleans Levee Board 6	*	1575
VALENTINE—		
Pan American Prod. Co., Harange 11	675	5426
WEST HACKBERRY—		
W. T. Burton, Vincent 4	48	2569
CAMERON PARISH—		
Pure, State 2, Mallard Bay area, 14-13s-3w	*	9445
JEFFERSON DAVIS PARISH—		
Continental, Greffin 1, nw of Lake Arthur, 32-10s-3w	*	lcn

*Failures; †Junked; ¶Million cu. ft. gas.

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23e, Lafourche Parish, tried to blow out at 575 feet, but was brought under control and is drilling ahead.

East of Gillis field, Calcasieu Parish, Wheeler Oil Corporation made location for School Land 2, 210 feet south and 200 feet east of the NWc NE 16-9s-7w. It is approximately 1500 feet north of the 7160-foot dry hole drilled by the same concern some time ago.

Two and one-half miles northwest of the Vinton field, Calcasieu Parish, Capitol Oil Company announced location for J. J. Pender 1, 330 feet north and 330 feet east of the SWc NE NE 18-10s-12w.

Continental Oil Company made location for Fay 1, southeast of South Roanoke, in the C S½ NW SE 31-10s-3w. At South Elton in the same parish Stanolind Oil & Gas Company made location for Calcasieu National Bank 3-B, 1650 feet north and 1980 feet west of the SEc 27-7s-3w.

In the Pine Prairie area of Evangeline Parish, Schlicher Production Company made location for Perkins 1, 518 feet north and 375 feet west of C 35-3s-1w.

Abbeville Test Cutting and Fishing

Continental Oil Company's Brookshire 1, Abbeville, Section 66-12s-3e, Vermilion Parish, was cutting and pulling stuck drill pipe last week after the well had blown out at 11,909 feet. About 47 stands of pipe have been recovered from the hole.

In the Jeanerette field, St. Mary Parish, Herton Oil Company was testing a new sand in Banta & Roanes 1, Section 40-13s-9e. Casing was perforated from 10,412 to 10,423 feet. The previous week the company tested the lower section of this sand and recovered salt water. Banta & Roanes 1 is the deepest well drilled at Jeanerette. The same operator's Roanes 5, Section 40-13s-9e, was abandoned at 8105 feet last week.

Six new Lisbon wells in face of no market outlet.

* * *

Arkansas end continues to lead Rodessa activity.

Shreveport.—Despite the fact that effective October 1 Gulf Refining Company reduced its purchases at Lisbon to 5000 barrels daily, this being the only pipe line outlet, and that operations were reduced sharply, six new wells were completed in that district last week, four in Claiborne and two in Lincoln parishes.

There were only 10 rigs operating besides five tests with final casing cemented waiting for a solution of the outlet problem. The present purchases are being divided ratably among the wells but this is caring for less than a third of the previous average daily runs which the week before were 15,835 barrels.

Grogan Oil Company's pipe line subsidiary is pushing work on its 6-inch line as fast as materials are available but it will not be finished before October 15 and that company plans to buy only 7000 barrels daily. Gulf Refining Company has indicated it will cease all purchases when the new line is completed.

Standard Pipe Line Company officials have denied reports it planned to run a line to Sugar Creek via Lisbon to its Weller tank farm. It had been reported this company planned to lay an 8-inch line along that route using 10 miles of such pipe stacked at Princeton, Bossier Parish, after having been removed from the Bellevue field to a loading rack at Princeton.

The Lisbon producing limits were extended a fourth mile northeast last week when Grady Vaughn and M. H. Marr completed Eppinger 1, SW SW 29-21n-4w, flowing 55 barrels per hour through ½-inch tubing choke at 5129 feet. The same operators' E. B. King 1, SE SE 30-21n-4w, had flowed 49 barrels an hour through 57/64-inch choke when completed a month ago. E. W. Gill and associates made location for S. M. English 1, C S½ NE SW 29-21n-4w, and A. O. Olsen made location for T. F. Patton A-2, SE SW 30-21n-4w. Lisbon's only other new location was an east outpost to the south, Magnolia Petroleum Company's F. Corbin B-1, C N½ NW NW 5-20n-4w. This test will offset the same company's F. Corbin 1, NE NE 6-20n-4w, which gauged 400 barrels in 24 hours at 5336 feet.

Three miles southwest of production and equidistant northeast of Sugar Creek, J. R. Bevill and associates' Alex Edmonds 1, NE NE 16-20n-5w, has made a total of 2100 barrels of oil to October 5 and continues to swab 75 barrels daily when not pumping.

It is reported that Triangle Drilling Company and associates contemplate an early location for a lower Marine test in Sugar Creek. This group of operators drilled Darrett 2, Section 31-20n-5w to 8616 feet and plugged it back and completed it in Travis Peak at 5703 feet after losing 600 feet of drill stem at bottom of the hole.

T. L. James & Company has leased 3000 acres checkerboarded in Townships 16 and 17, Range 7 west, Bienville Parish, southwest of the Bear Creek gas-distillate field in Section 3-16n-6w, which has two wells.

C. H. Murphy of El Dorado, Arkansas, has taken a geophysical and geological exploration lease on 15,000 acres of land in Township 3 north, Ranges 1 east and 1 west, Rapides Parish, "in the trend." A 5200-foot test will be drilled if exploration warrants taking the leases after six months.

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Miller County still leads Rodessa drilling activity

Shreveport.—Miller County, Arkansas' extension of Rodessa boosted its total of producers to 16 last week with 3 new wells, and continued to lead the rest of Rodessa with 32 active operations, including the wells completed. The Texas side of Rodessa has 34 active operations and the Louisiana side 7.

The wells completed were Freeman W. Burford's S. B. Davis 1, SE NE 11-20-28, flowing 60 barrels per hour through ¾-inch tubing choke with casing pressure 900 pounds and tubing pressure 100 pounds, total depth 6157 feet; Hunt Oil Company's Wommack 2, SEc 10-20-28, flowing 50 barrels per hour through 47/64-inch tubing choke at 6120 feet; and Layton Oil Company's E. S. Terry Estate 1, SWc W½ W½ 14-20-28, which flowed 108 barrels an hour through ¼-inch choke with casing pressure 700 pounds and tubing pressure 150 pounds, at 6060 feet.

Freeman W. Burford has plugged and abandoned Garver-Means 1, C SW NW 11-20-27, 6 miles east of Miller County production, at 6250 feet. Between this hole and the field, Burford's August 1, SW SE NE SW 8-20-27, after cementing 7-inch casing at 6123 feet, tested with no showing of oil or gas at 6230 feet and then plugged back to 6165 feet where another test by swabbing was being arranged.

Burford also had trouble with Ahearn 1, NE SW 10-20-28, which is being swabbed but refuses to flow. East Texas Refining Company's Capps A-1, C W½ 14-20-28, swabbed dry at 6089 feet and perforated from 6018 to 6023 feet and was swabbing again.

Fourth Well at Jefferson

The fourth oil well for the Jefferson end of the Rodessa field and the seventeenth for Marion County, Texas, in its two producing "spots," Lodi and Jefferson, was completed last week by Shell Petroleum Corporation in Lizzie Henderson 1, R. Bennington Survey. It was the company's first operation in the Rodessa area.

The well was washed in from 6014 feet and in the first 24 hours gauged 534 barrels, flowing through ¼-inch choke with casing pressure 650 pounds and tubing pressure 850 pounds. The gas-oil ratio was 569 to 1. This test logged saturated Henderson sand from 5956 to 5970 feet and Gloyd saturation from 5984 to 5994 and also from 5998 to 6001 feet. Seven-inch casing was cemented at 5975 feet.

Marion County has taken the bulk of activity on the Texas side away from Cass County, Marion County now having 18 active operations compared to 16 in Cass. Cass County accounted for 2 small wells last week and 2 locations were abandoned, the latter being Spray Oil Company's Scott 3 and 4, Robert Trammell Survey.

In the Lodi nose of Rodessa in Marion County, Fohs Oil Company's Mary McReynolds 2, A. de los Santos Coy Survey, failed to pick up any saturation in the Gloyd, cored ahead to the Dees which carried water, and with the Young missing was coring ahead for the Petitt (basal Glen Rose) at 6273 feet. The well's failure to find production in the Gloyd was due to a lack of porosity and not to structure, such occasions not being in-

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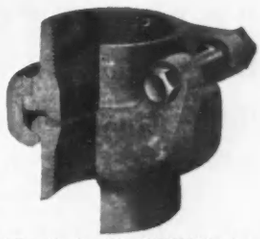

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SHREVEPORT LOUISIANA

Lake Charles—Houma—Converse
New Iberia—Rodessa—Monroe
Cotton Valley—Turnertown
Greggton—Houston

frequent in lime reservoirs. Union Production Company's Hutchinson 3, same survey, will prove whether there will be production south and southwest of Fohs' McReynolds 2.

Pressure Drop

The bottom-hole pressure average for September in the Texas part of the Rodessa field dropped 107 pounds, according to data compiled by the Texas Railroad Commission. The pressure dropped from 1879 to 1772 pounds for the 30-day period. Last month's bottom hole pressure for the Texas side of the field was 596,995 pounds as compared to 618,230 pounds the month before.

The schedule covering 337 wells gave the bottom hole pressure factor as .02650091 pounds and an acreage factor of one acre equals 2.508315 barrels. Total acreage allotted to oil production was 6,252.73 compared to 6,112.73 for the month before. Fifty-nine wells were listed as having high gas-oil ratios and 35 as producing from the Gloyd horizon.

Schedules were given for the wells in Marion County who were given allowables totaling 1,234 barrels.

Shreveport. — Prairie River Syndicate's Hutchinson 1, SW NW 15-15n-12w, lower Marine wildcat in Caddo Parish, 20 miles south of Shreveport was shut down last week at 9141 feet while operators were conferring over whether to drill the test to Permian lime or attempt to bring it in as a gas-distillate in the lower Marine horizon, which was topped at 8380 feet, the Bodcaw sand phase, productive at Cotton Valley, being logged at 8775 feet. Several drill stem tests have been made, one last week from 8987 to 9110 feet showing considerable gas. Another from 8990 to 9018 had shown 22 joints of mud-cut gas.

Shreveport.—Another oil productive horizon for the Sligo field, Bossier Parish, which has six oil producers from basal Glen Rose (Petitt) at 5300 feet, was shown as a possibility last week when Triangle Drilling Company tested Schuler 1, C SE NW 13-17n-12w. Bossier Parish, at 3118 feet, casing having set for the test. The well swabbed considerable oil but refused to flow. However, it rose half way to the top of the hole overnight. The formation is identified as a red bed series of the lower Cretaceous, about 400 feet in the lower Cretaceous.

NORTH LOUISIANA Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
CADDO PARISH (Rodessa)—		
Magnolia, G. W. Hardy 1, 1-23n-16w	140	6055
Standard, Parker C-1, 9-23n-16w	160	6012
CLAIBORNE PARISH (Lisbon)—		
R. L. Bauman et al, C. S. L. Patton 1, 1-20n-5w	500	5347
T. L. James & Co., Fowler 1, 32-21n-4w	240	5224
Magnolia, D. E. Fowler 1, 32-21n-4w	192	5254
Vaughn & Marr, Eppinger 1, 29-21n-4w	1200	5129
CLAIBORNE PARISH (Sugar Creek)—		
Union Power Co. et al, Stevenson 1, 6-19n-5w	¶52	5670
LINCOLN PARISH (Lisbon)—		
Lyons & Neely, H. W. Patton 2, 6-20n-4w	800	5335
Magnolia, F. Corbin 1, 6-20n-4w	400	5336
BOSSIER PARISH (Bellevue)—		
C. H. French, Larkin 1, 14-19n-11w	15	386
CADDO PARISH—		
W. J. Hunter et al, N. B. Stoer 1, 10-15n-15w	†2 & 15	6012
MOREHOUSE PARISH (Monroe)—		
Southern Carbon Co., Tensas Delta 18, 10-21n-4e	¶5	2161
OUACHITA PARISH (Monroe)—		
J. & H. Oil Co., Frost Lbr. Co. A-8	¶1½	2187
RED RIVER PARISH (Bull Bayou)—		
Gulf, L. E. Kennedy 28, 25-13n-11w	12	2552
UNION PARISH (Monroe)—		
Interstate Nat. Gas Co., Fee 73, 25-21n-3e	¶4½	2180
Fee 75, 25-21n-3e	¶25	2157

*Failures; †Junked; ¶Million cu. ft. gas.

Cities Service to build Rodessa gasoline plant

Shreveport.—Arkansas Fuel Oil Company, Cities Service subsidiary, last week announced plans for construction of a high-pressure gasoline absorption plant in the Jefferson part of the Rodessa field in Marion County, Texas. Location will be in the southern part of Heirs of J. Hanks Survey, about four miles northeast of the town of Jefferson. Both old and new equipment will be used in the plant and it is now being moved to the site.

Capacity of the plant wil be 25 million cubic feet of gas daily and a gasoline output of 15,000 gallons daily. Connections are now being laid to several wells of the 17 in Marion County. This is the first plant of this kind to be started in the Jefferson area and the second on the Texas side of the field. Phillips Petroleum Company recently started operating a similar plant in the Lodi sector.

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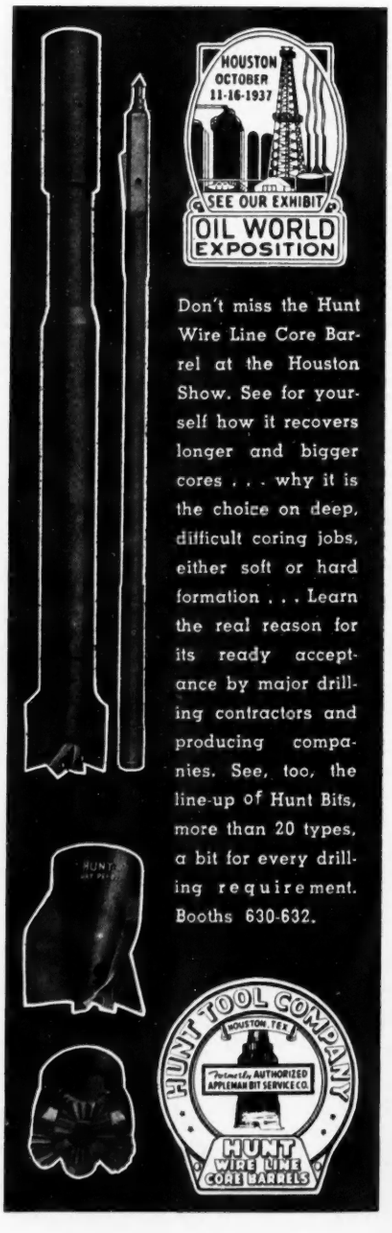
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ARKANSAS FIELDS

Schuler deep pay may be consistent

El Dorado.—That the newly opened lower Marine producing horizon in Schuler will be more consistent than the five lenses that produced in 13 wells from 5559 to 5950 feet, was indicated last week. Lion Oil Refining Company's Edna Morgan A-1, Section 18-18-17, Union County, which was coring in saturated formation, logged first oil in the recovery of 16 feet of well saturated formation in a 20-foot core from 7502 to 7522 feet. It was still in the formation at 7545 feet and preparing to core.

This test, which is the old original discovery well of the Schuler field being deepened, is 1¼ miles northwest of Edwin M. Jones and associates' Marine Oil Company, NW SW SE 17-18-17, recently completed in the new and deeper horizon. Lion's test logged saturation 38 feet higher than in Jones' Marine Oil Company 1.

Lion has staked a new location offsetting Jones' new well to the west, the new test being in NE SE SW 17-18-17. Jones is starting three new tests offsetting his well which October 6 gauged 2628 barrels of net oil through two-inch choke in a 24-hour gauge.

Lion Oil Refining Company's M. Justiss 1, NE NW NE 19-18-17, completed as an oil well last August 18, and which later turned to a dry gasser and was shut in, was reopened last week and was flowing 400 barrels of oil daily.

ARKANSAS
Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
MILLER COUNTY (Rodessa)—		
F. W. Burford, Garver-Means 1, 11-20-27	*	6250
S. B. Davis 1, 11-20-28	1440	6157
Hunt Oil Co., Wommack 2, 10-20-28	1200	6120
Layton Oil Co., E. S. Terry Estate 1, 14-20-28	2500	6060

*Failures; †Junked; ¶Million cu. ft. gas.

SOUTHEASTERN STATES

Mississippi wildcat test investigating probable show

Jackson, Miss.—Charles Green and associates were preparing last week to re-perforated casing around 2480 feet in Julian Taylor 1, NE SW 4-3n-1e, Wilkinson County, southwest Mississippi, "in the trend" after perforating with 12 shots at 2461-65 feet and bailing salt water. Total depth of the hole is 4048 feet in Minden limestone. An electrical logging device had shown some porosity at the level being tested. Elevation is 251 feet.

In the western part of Wilkinson County, Canal Oil Company has leased approximately 8000 acres, checkerboarded, in an area where Sun Oil Company has approximately 1000 acres under lease.

Claiborne County Development Company has let contract to H. N. Anderson and V. V. Ryan for Ruth Hayden 1, S½ SE 55-11n-2e, Claiborne County, Mississippi. They are rigging. Contract calls for a 2500-foot test with the option to continue to 5000 feet or top of Wilcox. Gulf Oil Corporation and Continental Oil Company have had geophysical parties in this county recently.

In North Mississippi, Waldrop and associates have completed the first of a series of core holes in Section 12-23n-9e, Calhoun County.

Mobile, Ala.—Joe Modisett and associates last week were drilling brown shale at 5325 feet in McCorvey 1, SE SW SW 20-9n-2w, Choctaw County, Alabama, a proposed 8000-foot test on the Hatchetigbee Anticline.

Gulf Oil Corporation, which recently added a seismograph unit to two gravimeter units working in the Florida Everglades, has had the gravimeter party make 1200 stations which as far as possible were at section corners of the tract of 1,100,000 acres in Lee, Collier and Hendry counties. The gravimeter unit is using a "swamp buggy" in its operations.

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ROCKY MOUNTAIN FIELDS

Minnelusa flow livens things at Lance Creek

Casper, Wyo. — The Lance Creek field, Niobrara County, moved into the limelight for Rocky Mountain drilling activity again this week when A. B. Cobb completed Novick-Ong 2, SEC SE SW 6-35n-65w, for 94 barrels of 42 gravity crude per hour from the deep Minnelusa horizon 5305 feet, with casing set at 5242 feet.

In addition to extending the limits of the Minnelusa pool another location to the southwest and starting a new drilling campaign for that sector of the field, the well established definitely the existence of deep production outside the limits of the Sundance around the entire periphery of the field. Located some 4½ miles west of the Minnelusa discovery well for the field, Ohio Oil Company's Leo 5 OPC-16, the Cobb well indicates that the limits of the deep pool extend well beyond the former proved limits of the field as established by Sundance producing wells, and preliminary surveys of the deep sand point out that the pool may be found to be of more gentle dips, corresponding to the Mid-Continent structures, rather than to the steep dips common to the Mountain region, in which case the extent of the field may be found to be several times greater than was heretofore believed possible. This strike has boosted estimates of the recoverable crude in the field from around 35,000 barrels per acre to nearly double that amount. The proved area of the Sundance pool of the field contains 2000 acres on which 45 producing wells are located. The well, under proration, are producing 10,500 barrels daily, as compared with an estimated potential production of 50,000 to 75,000 barrels daily.

A direct south offset to the new well, Makinnie Oil & Drilling Company's Thompson 2, NE NE NW 7-35n-65w, has resumed operations and is running rig prearatory to deepening to the Minnelusa formation.

To the north of the Cobb well, and on the west flank of the field, J. M. Huber Corporation is preparing to deepen Joss 1, NE SE NW 6-35n-65w, an old Sundance producer originally completed for 100 barrels daily in January, 1936. The hole will be carried to the Pennsylvanian series. The company is digging cellar and pits for H & M 1, NE NE 8-35n-65w, which will be carried to test the deep sand.

Continental Oil Company's Apex 1, Account 3, SE NE 31-36n-65w, an inside location, missed the Basal Sundance sands entirely, drilling out of the upper Sundance directly into red beds at 4144 feet. It is drilling at 4175 feet in the red beds headed for Minnelusa.

A similar non-conformity was encountered this week in the East Lance Creek high, where Continental Oil Company's Leach 1, SW NE NE 29-36n-64w, drilled out of the Lakota formation into the Sundance sand, missing the Morrisson beds. Absence of Morrison sands at this point makes the Sundance sands check considerably higher than in the Lance Creek field proper and brightens prospects for a commercial well in the area.

Along the east flank of the Lance Creek field, Ohio Oil Company is swabbing and testing production in Leo 1 OPC-7, NWC NW SE 35-36n-65w, in the Minnelusa sand with bottom at 5641 feet. Results of the test have been disappointing, the well having swabbed some 10½ barrels of fluid, mostly water, in 12 hours. The company's Taylor 2 OPC-32, NWC NW SW 3-35n-65w, also on the east flank of the field, is drilling at 6022 feet as a deep test.

Third Deep Badger Basin Well

The third producing well in the deep Badger Basin field was reported near this week. Resolute Oil Company's Government 1, C NE NE 20-57n-101w, is preparing to run 7-inch production casing to around 8585 feet. It is in the Frontier producing sand of the field, the deepest commercial field in the Rocky Mountain area. The company's Northern Pacific 1, C NE NW 21-57n-101w, is drilling at 5802 feet after taking an electrical test of the hole which revealed the well checking considerably higher than the company's State 1, second producer brought in on the field.

Ohio Oil Company reports good oil shows in Adam Pryde 1, C SW SE 24-56n-97w, in the Byron field, Big Horn County. It swabbed 195 barrels of fluid, 14 percent water, in 14 hours from the Embar lime at 5768 feet, plugged depth. This well checked considerably below the producing wells in the field and was believed to be off structure when first drilled. Hole went to 6060 feet in the Tensleep sand where water was encountered before plugging back.

In southern Wyoming, the joint well of Ohio Oil Company and The California Company in the Big Medicine Bow field, Carbon County, is nearing completion this week. Union Pacific-Cronberg 4, C NW NW 25-21n-79w, topped saturation in the Sundance sand at 5557 feet and drilled to 5643 feet in saturation. Operators have set 6⅝-inch casing on top of the saturated sand and are waiting on cement to set before drilling in. Casing has also been set on top of saturation at 5615 feet in Wm. Kyle 3-A, SW NE 26-21n-79w, and waiting on cement. Total depth is 5696 feet in the saturated sand.

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MOUNTAIN STATES Completions

MONTANA

Company, Well and Location	Init. Prod. Bbls.	Depth
GLACIER COUNTY (Cut Bank field)—		
Montana Headlight Oil Co. Yunck 10, csw sw 1-34n-6w	¶1¾	2737
Texas Co. Tribal 5 121 (N-615-A), csw se 6-33n-6w	*	3047
TOOLE COUNTY (Kevin-Sunburst field)—		
Welch Bros. Ward 1, cse ne 29-35n-3w	200	1770
Consolidated Gas Co. Lutz 1, cse ne 33-33n-2w	¶12¾	1519
A. H. Blose Burwash 6, sw nw sw 15-34n-1w	2	1025
Coolidge & Coolidge Keilbaugh 1, cnw se 13-37n-1w	*	425

WYOMING

Company, Well and Location	Init. Prod. Bbls.	Depth
BIG HORN COUNTY (Garland field)—		
Yale Pet. Corp. Stock-Jones 1, SEC lot 52-56n-97w	2880	4104
CARBON COUNTY (Bunker Hill structure)—		
Ohio, Wyoming Oil & Gas Co. 1, csw sw 29-27n-89w	¶5	1488
NIOBRARA COUNTY— (Lance Creek field)—		
A. B. Cobb, Novick-Ong 2, SE SW 6-35n-65w	1256	5305
SWEETWATER COUNTY (North Baxter Basin field)—		
Mountain Fuel Supply Co. Charles Stone 1, sw sw 18-19n-103w	3000	4120

*Failures. ¶Million cubic feet of gas.

EASTERN FIELDS

Illinois' second largest makes 2500-barrel flow

Pittsburgh. — Pure Oil Company's Palmer-Taylor 2, in the Noble field of Richland County, was brought in with an initial flow of 2500 barrels the first 24 hours, making it the second largest producer yet completed during the current Illinois drilling campaign and the largest producer of that county. The test ranks second to the same company's Bunny Travis 1, first well to obtain production from the McClosky sand, in the Clay City field of adjoining Clay County which made 2664 barrels the first day.

Ohio Oil Company's E. H. Arbuthnot 4, across the road from the Pure Oil Company strike, made 1500 barrels the first day. This company's No. 1 on this lease was the pool opener, having an initial yield of 2000 barrels. The strikes of last week in this field are reviving activity in the area. Pure Oil Company immediately made location for Palmer-Taylor 3, and Ohio Oil Company staked two additional Arbuthnot locations.

Test of Benedum-Trees Oil Company in Keith Township, Wayne County, near the Clay County line, gave indications last week of providing a new pool extending the northeast-southwest production trend in the Clay-Richland-Wayne County area. The well, Arthur Knapp 1, is apparently partly closed off from the main producing area by a dry hole. It is six miles from present production. Operators believe they have production in large quantities. At 3088 feet, the hole filled to 510 feet in 13 minutes. Six storage tanks are being erected.

Comparatively quiet since large production was found several months ago in Clay and Richland counties, the Wayne County area has once more become a center of drilling activity since reports of the favorable showing by the Knapp test. Benedum - Trees Oil Company started operations on another Knapp farm nearby, and Pure Oil Company resumed activities in the field. The latter company reerected a derrick on the Charles Billington farm, in the Cisne field three-quarters of a mile northwest of the George Bradley discovery well, and announced that drilling would be started immediately on the Elmer Byers track in the same field.

Indicating an extension of the Patoka field of Marion County to the west, Adams Oil & Gas Company, pioneer in the area, brought in Cephas Adams 1 in the Roseclaire sand, the second well to be completed in this formation, at 1590 feet. A pump has been installed but a production test has not yet been made. Officials expect a fair producer.

Interest in Effingham County, scene of much speculation in the buying and selling of leases and royalties, is centered on two wildcat tests: The Hazlett, Faurot & Mitchell Syndicate's Haarman 1, Watson Township, one mile south of Effingham, is at 2600 feet. Kingwood Oil Company's Arthur H.

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Bartels 1, Mason Township, resumed drilling Monday after setting surface casing at 150 feet.

A price of $1.26 a barrel for oil purchased in the Noble pool of Richland County has been posted by Ohio Oil Company. The price is the same as that posted by Pure Oil Company for its purchases in the Clay City field of Clay County. Crude of the Noble pool is from 37 to 38 gravity, said to compare favorably with the Mid-Continent 38 gravity crude at $1.26 in Kansas, Oklahoma, and Texas.

New York-Pennsylvania Failures

Two wildcat failures were reported in the New York-Pennsylvania deep sand gas fields, offsetting one good and two fair producers in this area. In Crawford County, on the Pennsylvania side, Potter Development Company's test on the N. D. Dahl farm, Havfield Township, was abandoned at 4522 feet after drilling through the Oriskany and Medina formations. The third dry hole to be drilled in this county in the past two years, it is expected to end operations in the area for some time. The second failure was by Cunningham Oil & Gas Company on the Norman Phelps farm, Addison Township, Steuben County, New York, directly east of the Woodhull field, which flowed salt water at 3829 feet. One foot higher a show of gas was encountered. The Onondaga lime was topped at 3800 feet and the Oriskany encountered at 3820 feet. Two of the producers were in the recently opened Woodhull field of Steuben County, which still has to report its first failure. Hanley & Bird completed Meyer 1 at 3953 feet with an initial open flow of 27,000,000 cubic feet, and Clancey et al completed Bates 1-A at 3858 feet with an initial of 14,000,000 cubic feet. The second test was completed two feet in the Oriskany, which was topped at 3856 feet. Top of the Onondaga was at 3828 feet. The third successful completion was by Potter Development Company on the Ida Scoville tract, Potter County, on the Pennsylvania side, which gauged 7,600,000 cubic feet when completed at 5245 feet.

Largest Eastern Fields completion of the week, outside of Illinois, was by South Penn Oil Company on the C. W. Markwell tract, McLean County, Kentucky, which had an initial of 100 barrels daily when bottomed at 1480 feet. Running a close second was the Licking County, Ohio, test of Emerald Petroleum Company and others on the I. M. Cochran farm, No. 3 on this lease, which produced 90 barrels the first 24 hours. Total depth was 3047 feet.

EASTERN FIELDS Completions

OHIO

Company, Well and Location	Init. Prod. Bbls.	Depth
ASHLAND COUNTY—		
Park National Bank of Newark, Howard E. Young 6	10	756
ATHENS COUNTY—		
A. D. Townsend, Chas. M. Wetherby 1	¶.45	1641
Gross & McCune, Chas. O. Lory 3	3	1168
BELMONT COUNTY—		
John L. Gillingham, John D. Hayes 1	*	830
COSHOCTON COUNTY—		
Preston Oil Co., J. L. Myers 3	60	3125
FAIRFIELD COUNTY—		
Lancaster City Gas Co., Ernest Lamb 3	¶.24	2110
GUERNSEY COUNTY—		
Ohio Fuel Gas Co., L. E. Parks 1	¶.09	1245
Geo. Jewell, John Martin 1	*	1100
HOLMES COUNTY—		
Ohio Fuel Gas Co., C. Nussbaum 1	¶.28	3295
HURON COUNTY—		
A. C. Leathers et al, Chapin 1	¶.24	844
Carrie P. Hall 1	¶.03	796
Reynolds 1	¶	875
Clarence Chandler 1	¶	...
JEFFERSON COUNTY—		
C. S. Kelly et al, James A. Tilfer 3	2	1220
LICKING COUNTY—		
North Fork Oil Co., J. C. Williams 10	7	775
Emerald Petroleum Co. et al, I. M. Cochran 3	90	3047
LORAIN COUNTY—		
William Dempsey, Julia A. Clark 4	*	2252
MEDINA COUNTY—		
Oko Oil & Gas Co., Jessie McVicker 52	1	474
MEIGS COUNTY—		
J. I. Clark et al, Susie Foster 2	*	1960
MONROE COUNTY—		
H. B. Walker, M. McVey 1	2	1615
MUSKINGUM COUNTY—		
Ed. H. Everett Co. et al, R. V. Roome 1	55	3258
NOBLE COUNTY—		
C. W. Rich et al, Helen B. Murphy 1	¶.09	1554
Burbaker et al, F. M. Calland 3	¶.05	1197
PERRY COUNTY—		
Ohio Fuel Gas Co., Sunday Creek Coal Co. 159	*	1970
PUTNAM COUNTY—		
Morton Stewart Petroleum Corp., W. D. Williams 3	15	1360
SENECA COUNTY—		
Liberty Oil Co., Eli Rosenberger 4	8	1455
STARK COUNTY—		
Obermiller et al, J. A. Willaman 1	¶.37	4243
E. Ohio Gas Co., Harvey P. Rohr 1	*	4156
TUSCARAWAS COUNTY—		
East Ohio Gas Co., M. & H. Fuhrer 1	¶1.33	4305
VINTON COUNTY—		
Kelch Bros., John Code 1	¶.11	710
WASHINGTON COUNTY—		
C. D. Uhl et al, J. A. Huffman 4	2	810
W. W. Watterson, Ray Evans 17	*	490

WEST VIRGINIA

Company, Well and Location	Init. Prod. Bbls.	Depth
BOONE COUNTY—		
Owens-Illinois Glass Co., J. C. Roberts 4	¶.28	2193
Little Coal Land Co., 19	¶.26	2065
W. S. Hatfield	¶.10	2280
CABEL COUNTY—		
W. C. Kingery et al, Mary Cole 1	¶.56	2739
CALHOUN COUNTY—		
Hope Natural Gas Co., Carl Shafer 7789	¶.12	2260
W. L. Sellers 7786	¶.08	2080
CLAY COUNTY—		
Virginian Gas & Oil Corp., Brown et al 42	6	1955
GILMER COUNTY—		
Carnegie Natural Gas Co., Ancil Reed et al 1	¶.10	1734
KANAWHA COUNTY—		
Pure Oil Co., Williams Coal Co. 275	12	3140
Godfrey L. Cabot, Inc., C. W. Richardson 1	¶.17	4148
MARSHALL COUNTY—		
Union Gasoline & Oil Corp., D. Bruce Parriott 2	¶.75	2250
PLEASANTS COUNTY—		
Newland Oil & Gas Co., J. T. Newland 2	¼	1116
ROANE COUNTY—		
Injun Oil Co., Rosella Drake Heirs 1	*	1750
TYLER COUNTY—		
C. A. Bell et al, J. C. Bell 1	*	1769

KENTUCKY

Company, Well and Location	Init. Prod. Bbls.	Depth
BRECKENRIDGE COUNTY—		
J. C. Miller, Whalen Heirs 2	*	550
DAVIESS COUNTY—		
Pennsylvania-Indiana Oil Company, First National Bank 16	25	....
Ellis & Ashby, Lena Mayfield 6	5	....
Daugherty & Ellis, C. W. Howard 2	*	1181
Rex-Pyramid Oil Co., Alice Hinton 13	*	....
Lonnie Cooper 2	*	632
HANCOCK COUNTY—		
J. C. Ellis, Smith Heirs 21	75	365
Hallie Mason 9	50	275
W. E. Hupp, Emma Poole 4	10	498
J. H. Taulbee, Mitchell Freel 2	10	552
Frank Damron et al, Elsie Bates 3	10	420
Fred Boling 3	¶1.70	558
Chester Oil Co., J. W. Baughn 10	*	385
HENDERSON COUNTY—		
Black Gold Oil Co., C. M. Gish 9	25	....
LEE COUNTY—		
South Penn Oil Co., Flahaven Land Co. 94	*	700
McLEAN COUNTY—		
South Penn Oil Co., C. W. Markwell	100	1480
Ellis & Huff, John Ditto 2	25	946
The Petroleum Co., Mrs. Bettie Cullen 14	*	....
OHIO COUNTY—		
Joseph B. Mayer, Tom Hamilton 2	10	....
Henry Scholl, Alex Whitehouse 5	*	....
WOLFE COUNTY—		
Charles Brown, Booth Heirs 1	10	1500

INDIANA

Company, Well and Location	Init. Prod. Bbls.	Depth
DUBOIS COUNTY—		
A. D. Shafer, Walter Mutchman 1	*	1202
GIBSON COUNTY—		
Midwest Development Corp., Wm. G. Volkman 1	¶	1700
M. & M. Producers, Inc., L. M. Corn 3	¶	296
Orvis J. Hutchinson 2	*	1736
HARRISON COUNTY—		
Indiana Utilities Corp., Clarence Bruce 1	*	....
HUNTINGTON COUNTY—		
E. C. Lantz, J. F. Ream 1	*	....
PERRY COUNTY—		
Hollingsworth Gas & Oil Corp., Elizabeth Grammelspacker 4	10	489
Zoercher & Dice, Dina Harth 1	*	....
PIKE COUNTY—		
Murphy Oil Co. of Pa., Essie Stewart 1A-31	15	1029
Rendall & Stroble, Jos. & Naomi Carr 5	10	1386
Midwest Development Corp., F. A. Schroluke 6	¶	733
John T. Reinsel, Frank Sorguis 1	*	765
SPENCER COUNTY—		
Charles E. Dice, Arthur Ray 2	10	786
August Kruse, A. Williamson 1	*	850
SULLIVAN COUNTY—		
O. A. Thayer, J. Bates 2	*	819

NEW YORK

Company, Well and Location	Init. Prod. Bbls.	Depth
STEUBEN COUNTY—		
Hanley & Bird, Meyer 1	¶27.00	3953
Clancey et al, Bates 1-A	¶14.00	3858
Cunningham Oil & Gas Co., Norman Phelps 1	*	3829

PENNSYLVANIA

Company, Well and Location	Init. Prod. Bbls.	Depth
CRAWFORD COUNTY—		
Potter Development Co., N. D. Dahl 1	*	4522
GREENE COUNTY—		
Union Gasoline & Oil Corp., T. M. Galentine 3	2	3530
Manufacturers Light & Heat Co., M. H. Nichols 1	¶.23	3329
Wm. Grimes 1	¶.20	3329
Waynesboro Home Gas Co., Marguerite Grover 1	¶.06	4022
Null & Milliken, W. P. Hoskinson 3	*	3278
POTTER COUNTY—		
Potter Development Co., Ida Scoville	¶7.60	5245
WASHINGTON COUNTY—		
Union Gasoline & Oil Corp., A. O. VanKirk 7	5	3035
Natural Gas Co. of W. Va., Rebecca J. Roupe 766	¶.15	2791
Manufacturers Light & Heat Co., R. O. McKahan	*	2950
WESTMORELAND COUNTY—		
Potter Development Co. & Wm. E. Snee et al, Indiana Savings & Trust Co. 1	*	7722

ILLINOIS

Company, Well and Location	Init. Prod. Bbls.	Depth
CLAY COUNTY—		
Pure Oil Company, Oscar Poppe 8	785	2780
Oscar Poppe 9	180	3010
D. L. Moseley 1	180	2976
Staley 1	*	3195
CLINTON COUNTY—		
Bartelso Oil & Gas Co., Schlarman 2	100	1016
MARION COUNTY—		
Adams Oil & Gas Co., Boyd 1	75	1421
Underwood 1	65	1444
Village of Patoka 1	20	1448
Wasem 3-A	18	1445
Wassem 6-A	10	1433
Ainscough 1	*	1618
O. Vickers et al, Elizabeth Farmer 1	*	1455
Frank Frederick et al, Hill 1	*	1459
Bivens et al, Cruse Riley & Simcox 1	*	1461
PERRY COUNTY—		
Howard Forester, Howard Forester 1	*	5153
RICHLAND COUNTY—		
Keith & MacMahon, E. C. Taylor 1	*	3009
WASHINGTON COUNTY—		
Sunflower Oil Co., H. Bergman 1	*	1000
WAYNE COUNTY—		
Myers & Fitzpatrick, Shannon 1	250	3067

*Failures; †Junked; ¶Million cu. ft. gas.

MICHIGAN FIELDS

Buckeye appears to be limited on three sides

Mt. Pleasant.—Further extension of the Buckeye field, Gladwin County, this week appeared definitely limited on three flanks as a result of two Dundee limestone test failures and a third test showing but small pumper possibilities.

The biggest setback to continued expansion of the year's most active district came with failure of Sun Oil Company's Henderson 1, NE NW SE 4-18n-1w, Buckeye township, two locations due west of Mammoth Producing & Refining Company's Wood 1, which initialed 260 barrels from Dundee two months ago when completed. The Henderson test showed a 30-foot structural drop (Dundee 3608 feet) and was bottomed out at 3693 feet with 700 feet of water and only a light oil show at 3683 feet. Failure of this test apparently closes several hundred acres heretofore expected to be productive. The productive flank can still be extended north, however, and two tests are being started to determine the value of the north acreage.

Dibble Brother's Kimble 1, Section 16-18n-1e, Hay township, a half mile east extension test of the Upper Buckeye pool, logged Dundee lime at 3589 feet and had a show now under test at 3636 feet. Structural drop on the Kimble, water invasion on the lime of farthest east producing wells in Buckeye combines to point to the established productive edge.

A mile west extension attempt of Lower Buckeye by Louis Ross on the Peters 1, NE SW SE 34-18n-1w, also failed in the Dundee limestone.

Harold J. Hand's Smart 1, Section 29-17n-2e, Bentley township, Gladwin County, a seven mile southeast extension producer of Buckeye, is producing about 40 barrels daily on the pump at 3497 feet (Dundee 3414 feet). Operators may deepen 12 to 20 feet and re-acidize. Champman Oil Company is moving in a mile southeast, Rowmor Corporation has staked a north offset and Gulf Refining has made a tentative east offset location.

Gulf, Pure, Carter, and Shell, who have considerable acreage in the Bentley play along with several independents have agreed to use a 1 well to 20-acre spacing program. One to ten acres is the standard in the field excepting Pure's Yost-Jasper area in Midland County, where the field has been developed on the 1 to 20 spacing pattern.

Boston Oil & Gas Company after failure to get a packer shut off on the Fox 1, Section 23-15n-5w, Isabella County, has re-run casing and will cement. Operators are undecided whether to acidize at the present depth of 3825 feet or drill deeper. On swab tests the

MICHIGAN Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
ALLEGAN COUNTY—		
Allegan Crude Oil Co.'s Heasley 2, sw ne ne 21-4n-13w	500	1605
E. L. Andrews' Perrigo 1, se ne nw 28-2n-13w	*	1625
Muskegon Oil Corp.'s Hardy 1, se sw se 16-4n-13w	100	1606
ARENAC COUNTY—		
Hal Be Oyle Co.'s Peavy 2, sw sw se 4-20n-4e	10	2605
Great Western Petrol Co.'s McKay 2, ne nw se, 10-20n-4e	150	2598
Mich. Devonian Pet. Co.'s State 1, nw nw sw 11-20n-4e	100	2615
CLARE COUNTY—		
James A. McKay's Fee 11, sw se nw 4-17n-4w	*	1593
CLINTON COUNTY—		
J. T. Norris, Tr.'s Sturdivan 1, sw nw nw 36-7n-2w	*	1100
GLADWIN COUNTY—		
Mammoth Pro. & Ref. Co.'s Nunn 1, nw ne nw, 18-17n-2w	*	4095
Turner Pet. Co.'s Schranz 2, sw se se, 3-18n-1w	380	3648
Sun Oil Co.'s Henderson 1, ne nw se 4-18n-1w	*	3693
Louis Rose's ePters 1, ne sw se, 34-18n-1w	*	3695
Bell & Mark's Arkwright 2, ne sw ne 35-18n-1w	150	3589
M. L. Jorgensen's Foster 1, ne ne nw, 26-18n-1w	250	3600
ISABELLA COUNTY—		
Witmer Oil Co.'s Hovey 1, c s½ se se, 2-15n-4w	10	3736
MONTCALM COUNTY—		
Kinwell Oil Co.'s Cole 1, c nw, 14-12n-7w	¶1	1252
OGEMAW COUNTY—		
H. C. Nelson's State 7, nw nw sw, 31-22n-3e	40	2597
Harold J. Hand's State 1, ne ne ne, 30-23n-1e	*	902
SHIAWASSEE COUNTY—		
T. K. Buzard's Galloway 1, nw ne, 11-6n-3e	*	1830

*Failures; †Junked; ¶Million cu. ft. gas.

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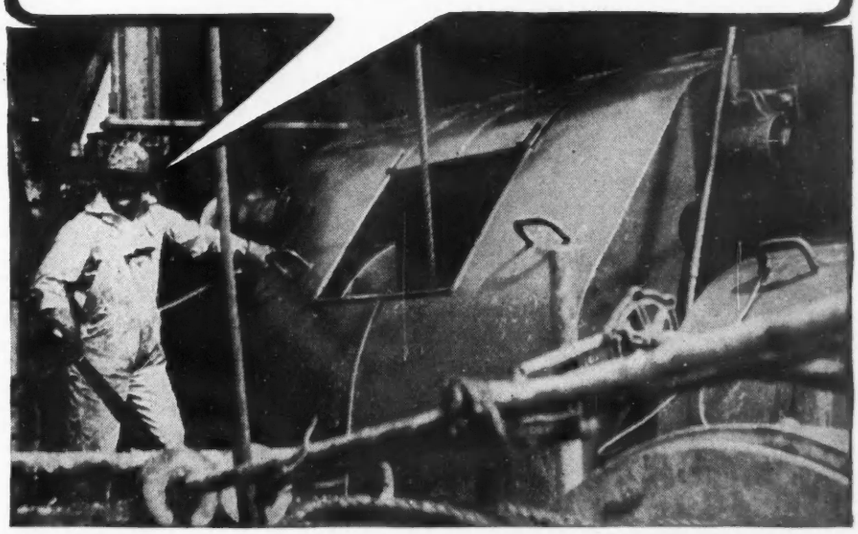

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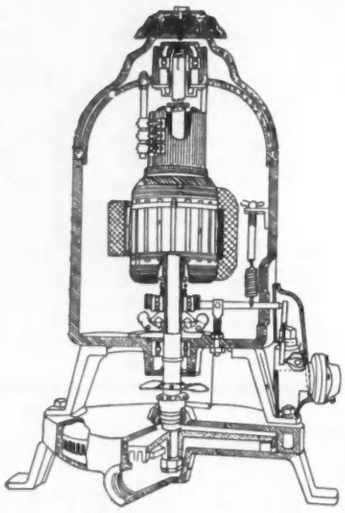

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well has flowed and swabbed as high as 42 barrels over a 24-hour period. Production is from the Monroe limestone.

Next Michigan Exposition in 1939

Mt. Pleasant.—Directors of the Michigan Oil & Gas Exposition, at the annual meeting here, voted to present the exposition only every other year, with the next show in 1939.

The first exposition was presented here in 1935 with other shows in 1936 and this year.

Record Michigan acid job performed

Mt. Pleasant.—A record gallonage of acid, 10,000 gallons, in Michigan was applied by the Dowell, Inc., to Gulf Refining Company's Kiander 2, 10-20n-4e, Clayton township, Arenac County, last week. The well originally was completed in the Dundee limestone at 2600 feet and twice treated, once with 1000 gallons and once with 2000 gallons before the record charge.

Production increased from 20 barrels daily to 192 barrels the first day following treatment. Previously 6000 gallons was the biggest gallonage used in Michigan.

CALIFORNIA FIELDS

New Kern County strike three miles from Greeley.

* * *

Three outpost tests are drilling below 11,000 feet.

Los Angeles.—Probability that a new field is to be opened in Kern County was seen this week in showings of Superior Oil Company's Kern County Land Company 9. With bottom at 7605 feet, formation tester set at 7550 feet indicated an initial flow of 2000 barrels of oil and 9,000,000 cubic feet of gas. Coring has been continued to 7714 feet and how much deeper it will be carried has not been decided. This well is 330 feet south and 990 feet west of NEc 3-30-26, and is 3 miles southeast of production in the new Greeley field, and is thought to be separate rather than an extension. Location is on land formerly held by Standard Oil Company in an area of small farm tracts of 20 to 40 acres, pointing to the probability that there will be much drilling if the production proves important. Superior Oil Company has more than 2000 acres under lease.

Standard Oil Company's K. C. L. 12-2, Greeley outpost, located 2310 feet north and 997 feet east from the southwest corner of Section 16-29-26, with bottom at 7680 feet, and with 9-inch cemented at 7580 feet, ran formation tester to flow at 3500-barrel rate, plus 20,000,000 cubic feet of gas. The oil is 34 gravity.

Standard Oil Company is drilling 5 wells in the Greeley field and is preparing to start another. Wells are widely spaced, and limits of the field have not been defined.

A recent completion established a potential of 3560 barrels of oil and 50,000,000 cubic feet of gas. Total initial of the first seven wells completed was 12,827 barrels, but due to the present proration program, these wells are not permitted to produce in excess of 2000 barrels. The gravity of the oil ranges from 34 to 36. Greeley is another field prospected on the basis of the geological interpretation of a seismograph survey. The second well drilled was dry, although it now stands between two of the best producers in the field.

El Segundo, new field for Los Angeles Basin, near the ocean, is becoming more active. During a recent three-day period, three new wells were completed with a total flush production of 9580 barrels. The oil is 27 gravity, and usually a new producer flows 2,000,000 cubic feet of gas. The best completion was Standard Oil Company's Refinery 3, total depth 7091 feet, which established a potential of 3900 barrels of 27 gravity oil, cutting 5 percent. Richfield Oil Corporation's Elsie 2, total depth 7050 feet, was completed for 3680 barrels of 27.5 gravity oil and 2,350,000 cubic feet of gas. Sunshine Oil Company's Elsie-Edison 1 was completed for 2000 barrels and on the second day was gauged at 1350 barrels, cutting only 2 percent.

Richfield Oil Corporation's Elsie 2 cemented 11¾-inch at 1112 feet, and the next string landed was 8⅝-inch at 6900 feet. Total of 176 feet of 7-inch liner, including 150 feet of perforated, was landed at 7050 feet, and the flow is through 3-inch tubing hung at 6848 feet. The pressure on the tubing is 125 pounds and 450 pounds on the casing.

Fourteen wells are drilling at El Segundo and four rigs are up. During the past few days, nine locations have been spotted. The oil has a fair gasoline content and the field is located only a short distance from Standard Oil Company's large El Segundo refinery.

Wilmington easily continues to be the busiest field in the state with indications it will continue to be for

months to come. Scouts report 17 rigs and foundations, in addition to 18 new locations. There are 21 wells actively drilling. Standard Oil Company is building an 8-inch pipe line to the field and as soon as the line is completed, a posted price will be announced, with a minimum of 75 cents. Small refiners have been buying oil from the smaller companies at prices ranging around 50 to 60 cents, although in some instances better prices prevailed.

A controversy is now in progress between the city of Long Beach and State of California as to ownership of the mineral rights to certain harbor lands, etc. Pending some agreement, drilling this disputed area is held back. There is a chance that the question will be settled the coming week, and many are of the opinion that the city will win. An ordinance regulating the drilling in this area has been read twice and only one more reading is needed to place such regulations in effect.

Richfield Oil Corporation has leased 18 acres from Procter & Gamble under terms that forbid derricks on the property, making it necessary to lease an adjoining 3-acre tract where the derricks will be erected and the holes diverted under the 18-acre lease. General Petroleum Corporation, drilling on the Ford Motor Company property, can and will direct some of the holes under the Ford plant. Other wells will be drilled to bottom under channels and under part of the Long Beach Harbor.

Three Holes Below 11,000 Feet

Kettleman North Dome Association's No. 4-18J, Kettleman Hills outpost, is drilling in barren gray sand at 11,323 feet, coring all the time. In the Rio Bravo area of Kern County, Union Oil Company's Kernco 1-34, Section 34-28-25, is coring in hard brown shale at 11,090 feet. In the Wasco area of Kern County, Continental Oil Company's K.C.L. A2, Section 8-27-24, is coring in shale at 11,080 feet.

Another deep hole is Tide Water Associated Oil Company's Lloyd 137 in the Ventura Avenue field, which is preparing to complete with bottom at 10,060 feet. This hole has 9⅝-inch cemented at 8667 feet and has run 1400 feet of 7-inch, including 1238 feet of perforated, and landed at 9983 feet, preparatory to a production test.

In the Oxnard area near the city of Oxnard, Oxnard Oil Company's Vanoni 1, Section 10-1-22, with bottom at 6302 feet, is running a series of formation tests to locate the best looking zones from 5993 feet to bottom. These tests are being watched with interest since the outcome of this test will decide the drilling trend by other lease holders in immediate future.

CALIFORNIA

Completions

Company, Well and Location	Init. Prod. Bbls.	Depth
BELRIDGE—		
Belridge Oil Co. No. 61-26	2775	8400
KERN FRONT—		
Texas Co., Lehman 9	50	2065
KERN RIVER—		
Alfred Fuhrman, No. 10	20	620
LOST HILLS—		
Standard, United 4	75	1296
MIDWAY-SUNSET—		
Hallmark Oil Co., No. 7	300	2802
Standard, No. 23-D	190	3413
C. C. M. Oil Co. W P 1	*	3584
MOUNT POSO—		
Ring Oil Co., Blackfoot 2	225	1805
MOUNTAIN VIEW—		
General, Freeport 2	340	4760
Hogan Pet. Co., Peters 3	375	5212
ROUND MOUNTAIN—		
Eastmont Oil Co., Olcese 4	150	1750
Honolulu Oil Corp. No. 25	30	1915
H. A. McDonald, Larkin 1	495	1950
Pebble Beach Oil Co., Olcese 1	*	1703
EL CAPITAN—		
Shell, Covarrubias 2-2	40	2992
SANTA MARIA VALLEY—		
Hancock & Bush, Hopkins 2	2000	4505
Pacific Western Oil Co., Hobbs 2	115	4132
VENTURA AVENUE—		
Tide Water, Lloyd 61	150	7070
Lloyd 62	50	6080
Lloyd 125	55	7375
MOUNT POSO—		
Golden Bear Oil Co., Hyde 1	*	1887
Vedder Pet. Corp., Hyde 1	*	1912
MADERA COUNTY—		
Seaboard-Tide Water, General Gill 1	*	6388
EL SEGUNDO—		
Richfield, Elsie 2	3680	7050
HUNTINGTON BEACH—		
Standard, Thompson 15	195	3802
LONG BEACH—		
Richfield, Denni 10	50	4967
REDONDO—		
Calmore Oil Co., C.O.C. 2	60	3642
WILMINGTON—		
Bankline Oil Co., D.H.C. 25	675	3307
T.P.C. 10	250	3387
General, Ford 12	3000	4040
Ford 17	920	5440
Isco A-4	375	3660
MacMillan Pet. Co. Hayes 7	310	3580
O'Dell & Dunlal, No. 1	280	3634
Texas Co., Refinery 1	140	3500

*Failures; †Junked; ¶Million cu. ft. gas.

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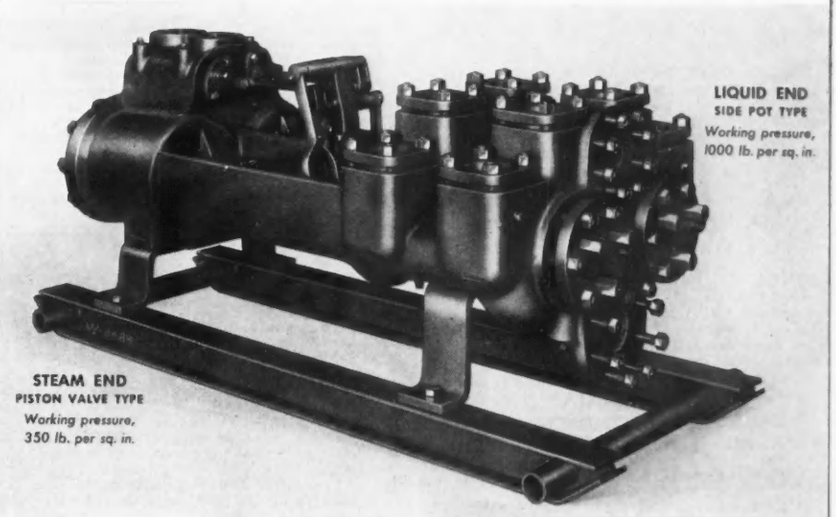

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IMPORTANT WILDCAT TESTS

ARKANSAS

CALHOUN COUNTY—Hayner et al's Brandon 1, sw nw sw 34-11-13, rur.

CLEVELAND COUNTY—J. R. Lockhart's Hernsberger 1, se ne 16-11-13, dk and mir.

CLARK COUNTY—Pat Carlin et al's Clark 1, 22-10-21, lcn abn at 102 ft.

COLUMBIA COUNTY—Kerrlyn Oil Co.'s Barnett 1, sw ne 14-17-20, dr 560 ft. Standard of La.'s McKean 1, c sw sw 8-16-22, 9⅝ in csg 4692 ft, dr 7136 ft, shale strks anhydrite. Tidewater Associated-Seaboard's C. N. Crumpler 1, nec sw 24-17-19, dr 4050 ft, lime and shale.

CRITTENDEN COUNTY — Stanley Oil Corp.'s D'Anna 1, 18-8-9, coring 1780 ft.

DREW COUNTY—Sloan Wells et al's Hardy 1, sec nw 3-14-7, rur.

LINCOLN COUNTY — Fitzwater, Inc.'s Owen 1, nw se ne 26-9-8, no report.

LONOKE COUNTY—Frank Silver's Chambers Est. 2, sw ne sw 17-2-7, wo 1500 ft.

MILLER COUNTY—Freeman W. Burford's August 1, 8-20-27, cemtd 7-in csg woc, td 6170 ft. Garver-Means 1, 110-20-27, arr abn, td 6220 ft.

NEVADA COUNTY—W. E. Lokey, Tr.'s Purifoy 1, ne ne 17-11-20, sd 1800 ft. A. M. Lacey's Bennett 1, c sw ne 28-14-22, rur. Union Drlg. Co.'s R. W. Fuller 1, nec se 6-13-21, sr, td 1895 ft.

OUACHITA COUNTY—Benedum & Trees Oil Co.'s G. W. Slaughter 1, nw nw 24-14-19, spd 13⅜ in csg 474 ft, dr 1050 ft. Copenhaver Oil Corp.'s J. E. Evans 1, ne sw 20-11-19, elev 154 ft, co 1730 ft. O. F. Whittaker's C. C. Guttry 1, se sw se sw 21-15-19, mim.

SEVIER COUNTY—C. & M. Oil Co.'s Arnold 1, sw nw ne, 8⅝ in csg 75 ft, dr 1000 ft.

UNION COUNTY—Edwin M. Jones et al's Marine Oil Co. 2, sw nw se 17-18-17, rur. Marine Oil Co. 3, nw se 17-18-17, dk; Marine Oil Co. 4, sw se 17-18-17, mim. Lion O. R. Co.'s Morgan A-1, 18-18-17, coring saturated formation 7535 ft.

CALIFORNIA

FRESNO COUNTY

PANOCHE—J. A. Gauther's Hubbard 1, 12-14-11, lcn.

CLOVIS—Central Valley Oil Co.'s No. 1, 1-12-20, rigging cable tools.

HURON—Puron Oil Co.'s S. P. 1, 31-18-17, spud 9/27, set 13⅜ in 1705 ft, td 1770 ft.

KERN COUNTY

DEVIL'S DEN—Amerada's Beer 5, 22-26-19, grading lcn.

MIDWAY SUNSET—American Empire Oil Co.'s No. 1, 20-31-24, rig.

LERDO—Arkelo Pet. Co.'s No. 41, 23-28-26, td 10,056 ft, redr to 7780 ft, fsh dr pipe.

McKITTRICK—Par-Mer Oil Co.'s No. 1, 6-31-22, dr shale 422 ft. Rocima Oil Co.'s No. 1, 20-30-22, rig.

WASCO—Continental's No. 2, 8-27-24, dr shale 11,077 ft. Seaboard Oil-Tide Water Associated's K.C.L. C-1, 26-27-24, sd 10,213 ft.

ROSEDALE—Continental's K.C.L. 13-1, 12-29-26, fsh 10,205 ft.

ARVIN—General's Houchin 1, 27-31-29, dr 7078 ft.

BELRIDGE—General's Helens 1, 12-28-20, dr 660 ft.

GRAPEVINE—Hall-Baker Co.'s Tejon 12, 1-10-19, dr gray sand and oil sand 2110 ft. Reserve Oil & Gas Co.'s Tejon 33-2, 33-11-19, td 4505 ft, redr 4477 ft.

ROUND MOUNTAIN—Rudolph Pageman's No. 1, 10-28-29, rig.

STRAND—Ohio's K.C.L. E-3, 14-30-25, dr gray sand 5832 ft.

MOUNTAIN VIEW—Section Six Oil Co.'s Johnston 1, 6-31-29, dr shale 5511 ft.

TEN SECTION—Standard's K.C.L. 15-1, 27-30-26, rig.

SEMI TROPIC—Standard's Randolph 2, 14-27-23, dr shale 4361 ft.

McGUNDEN—Standard's Routzong 1, 2-30-28, dr shale 1076 ft.

McFARLAND—Stone & Freid's No. 1, 34-25-25, rig.

GREELEY—Superior's K.C.L. 9, 3-30-26, outpost well, td 7605 ft, oil sand 7564 to 7573 ft, and 7575 to 7579 ft, formation tester run estimated good for 1500 bbls oil and 9,000,000 cu ft gas.

ROUND MOUNTAIN—Tampico Pet. Co.'s Bass-Goodnight K-3, 17-28-29, td 1867 ft, in oil sand, cemented 8⅝ in 1849 ft.

SOUTH MARICOPA—Texas Co.'s Pioneer 1, 33-11-23, dr shale 3410 ft.

RIO BRAVO—Union's Kernco 1-34, 34-28-25, dr shale 11,030 ft.

HUMBOLDT COUNTY—Texas Co.'s Eureka 2, 22-3-1, td 7708 ft, plug 5737 ft, swabbed 1,400,000 cu ft, casing pressure 1100 lbs.

KINGS COUNTY — Pyramid Prod. Co.'s Retherford 1, 27-24-18, foundation.

MADERA COUNTY — Seaboard-Associated-General's Gill 1, Joint test 27-12-15, abn 6388 ft.

MERCED — Amerada's Carano 1, 19-10-11, wocs 13⅜-in 610 ft.

SAN JOAQUIN COUNTY — Standard's Weil-Zuckerman 2, 25-2-4, rur.

SAN MATEO COUNTY—Wilshire Oil Co.'s Cowell 1, 20-6-5 (Half Moon Bay), dr shale 1890 ft.

SOLANO COUNTY—Amerada's S & S J 1, 24-4-2, dr sand thin streaks shale 4210 ft. Tracy Dr. Co.'s Hanson 1, 25-4-2, dr shale 3310 ft.

TULARE COUNTY—Magnet Oil Co.'s A. O. G. 3, 29-24-24, dr shale 7066 ft. Standard's Morris 1, 36-24-23, dr shale 8526 ft. Trico Oil & Gas Co.'s Valley 2, 35-21-25, rig.

YOLO COUNTY—Standard's P. Cook 1, 32-12-1, dr shale 3344 ft; Hooper 1, 32-9-1, td 4423 ft in shale, running formation tester.

MONTEREY COUNTY—California Oils' No. 2, 33-23-15, lcn. Elba Oil Co.'s Elba 1, 6-12-1, (Moss Landing), td 3968 ft, swabbed water trace oil; Elba 2, 6-12-1, rig.

SAN LUIS OBISPO COUNTY—Hancockk Oil Co.'s Dicks 1, 30-12-33, dr fractured shale 3178 ft.

SANTA BARBARA COUNTY—E. C. Arnold's Apache 2, 8-8-33, td 6374 ft, pumping 125 bbls 28 gravity oil, 25 percent mud and water. Carpinteria Oil Co.'s No. 1, 34-4-2, rig. O. C. Field's Santa Rita 1, 11-7-33, fsh 3358 ft. Gaviota Oil Co.'s Hollister 1, 35-5-33, td 3207 ft, set 8⅝ in at 3185 ft, ran formation tester, good for 8,000,000 ft gas, to install heavier equip. Petroleum Securities Co.'s Los Alamos 2, 6-7-32, dr gray fractured shale 6370 ft. Tide Water Associated's Leonis 1, 3-6-33, dr conglomerate 3882 ft.

VENTURA COUNTY—Gauthier Oil Co.'s No. 1, 22-4-26 (Summerland) lcn 1200 ft south 2100 ft west from northeast corner 22-4-26. Oxnard Oil Co.'s Vanoni 1, 10-1-22 (Oxnard), td 6302 ft, to cement 6⅝ in on bottom, to perforate. Seven Seas Oil Co.'s Johnson 1 15-1-22 (Oxnard), td 1038 ft, wocs 13⅜ in 953 ft. Texas Co.'s Chaffee 1 (Oxnard), bldg roads. Cava Oil Explor. Co.'s Livingston 1, 6-1-21 (Oxnard), td 4219 ft, ran formation tester, good blow of gas, to core ahead. Richfield Oil Corp.'s McFarland 1, 13-2-21 (Camarillo), dr sandy shale 4628 ft.

SOUTHERN CALIFORNIA

NEWHALL—Barnsdall's Rancho S. F. 2, 26-4-17, td 5090 ft, plug 2190 ft, cemented fish in place to redr. Holbrook Pet. Co.'s Newhall Land 1, 28-4-18, td 6224 ft, plub 2950 ft, testing by stages.

PICO CANYON—A. G. Burt's No. 1, 36-4-17, dr hard brown shale 2196 ft.

PUENTE—Camaroo Oil Co.'s Stern 1, 33-1-9, dr sand and shale 2153 ft.

WHITTIER—T. R. Davis & Associates' No. 1, 22-2-11, lcn.

NORTHWEST MONTEBELLO — Frank Fuller & Associates' Garvey 1, 27-1-12, rig.

PLAYA DEL REY—Robt. C. Hall's No. 1, 22-2-15, lcn.

PALOS VERDES—Hunter-Devlin & Associates' No. 1, 17-4-14, dr shale streaks oil sand 4773 ft.

WALNUT—Julian & Criswell's Langstaff 1, 5-2-9, dr shale streaks hard sand 2723 ft.

PALOS VERDES HILLS—McClarin Bros.' No. 1, 27-4-14, td 3970 ft, redr to 1870 ft, sd; No. 2, 27-4-14, rur.

CASTIAC — Royal Lands Corp.'s Ramona Hills 1, 8-4-17, rig.

SUNSET BEACH—A. S. Johnston Dr. Co.'s No. 30, 20-5-11, abn 6487 ft.

KANSAS

BARBER COUNTY — Olson & Skelly Oil Co.'s Elsea 1, sw se nw 27-32s-14w, run 7-in csg. Helmerich & Payne et al's Blunk Estate 1, cse 18-34s-13w, dr 4673 ft. W. I. Southern, Inc.'s Davis 3, se se ne 24-34s-15w, dr 5454 ft. Kansan Oil Corp.'s Mease 1, ne se se 27-30s-11w, rot rig. Palmer Oil Corp. et al's Warwick 1, cnw 29-31s-10w, rur.

BARTON COUNTY—Ralph Wixon et al's Buhrle 1, se se ne 14-16s-13w, sd 3175 ft. Armes & Vernon O&G Co.'s Persons 1, sw sw se 7-17s-13w, dr 2890 ft. C. L. Price et al's Hammeke 1, ne ne sw 12-18s-12w, 1800 ft oih. Brouk & Nat'l Ref. Co.'s oGry 1, nw nw sw 10-17s-13w, sd 2450 ft. Shell Pet. Corp.'s Peterman 1, se ne se 13-16s-14w, rust. Arch Merriam et al's Norris 1, ne ne nw 33-17s-11w, ru. Martin & Foraker et al's Dick 1, ne sw sw 31-19s-11w, brr. Tom Palmer et al's Polzin 1, nw nw se 4-16s-12w, rot rig.

BUTLER COUNTY—Rex & Morris et al's Stephens 1, sw sw se 35-23s-3e, td 2696 ft, D&A.

CHAUTAUQUA COUNTY—C. L. Brosius et al's Garrett 1, nw sw nw 26-32s-11e, co 1545 ft. Harrison et al's Brown 1, ne se ne 19-34s-10e, sd 510 ft. S. H. Vineard's Hughes 1, ne ne se 13-32s-12e, sd 426 ft. W. G. Buffington's Fisher 1, cwl sw nw 10-34s-9e, sd 1050 ft. Ingot Oil Co.'s McKee 1, sw ne sw 21-32s-12e, dr 1515 ft. I. W. Siegel's Temple 1, sw sw sw 31-32s-12e, mach.

CLARK COUNTY—Olson Oil et al's Watkins 1, sw sw nw 23-32s-21w, set surf pope 261 ft. Olson Oil Co.'s Lehman 1, se se sw 20-32s-21w, rot rig.

COWLEY COUNTY—Pryor & Lockhart's Brown 1, ne se se 34-33s-3e, dr 3562 ft. G. M. Smith and C. L. Price' Henderson 1, sw sw sw 25-32s-6e, ru mach. Arthur Brewer Co.'s Starkey 1, sw sw ne 16-30s-4e, td 2802 ft, 1100 ft oih. Earl Wakefield's Whitson 1, sw ne se 8-32s-4e, mim.

EDWARDS COUNTY — Douglas & Gears' Meade 1, se se nw 35-25s-16w, sdo.

ELLIS COUNTY—Earl Wakefield et al's Burnett 1, nw nw ne 1-11s-18w, td 3522 ft, 3000 ft oih. Lario O&G Co.'s Ball 1, nw nw ne 8-12s-18w, ur 8-in csg 2878 ft. P. G. Reynolds et al's Karlin 1, nw nw nw 13-12s-18w, ur 8-in csg 2802 ft. Skiles et al's Jensen 1, sw se ne 26-12s-18w, sd 2910 ft. Colonial Oil Co. & Bernheimer's Allbert 1, sw sw ne 31-12s-18w, ur 13-in csg 1260 ft. L. M. Reynolds et al's Polcyn 1, se se ne 24-13s-16w, dr 3130 ft. Brunson Drlg. & Glimac Oil Co.'s Weisner 1, se sw se 31-13s-17w, Aw/500 gals, swb 2 bbls oil per hr. Aylward Prod. Co. et al's Berens 1, se se se 10-14s-16w, dr 825 ft. Buffalo Oil Co.'s Phillips 1, ne ne ne 18-14s-16w, swb 393 bbls oil, 9 hrs.

ELLSWORTH COUNTY — Colonial Oil Co.'s Hogy 1, nw nw sw 16-16s-10w, ru. Hinkle et al's Alden 1, se se sw 17-17s-10w, dr 1490 ft. Hinkle et al's Adrea, 1, ne ne se 17-17s-10w, ru.

FORD COUNTY—Olson Oil et al's Fowler 1, csw¼ 26-27s-22w, rot rig.

GRANT COUNTY—Panhandle Eastern P. L. Co.'s Taggart 1, c sec 11-30s-37w, testing. P. K. Wilson's Helmly 1-22, cse¼ 22-28s-37w, lcn. R. K. Wilson's Bank 1-20, cne¼ 20-28s-37w dr 1670 ft.

GRAY COUNTY—P. G. Reynolds' Watkins 1, csw 32-28s-28w, ru.

GREENWOOD COUNTY—Ward McGinnis

ABBREVIATIONS

The following abbreviations, signs, etc., are used in completions and wildcat reports in THE OIL WEEKLY.

*—*dry hole abandoned well.*	owdd—*old well drilling deeper*
‡—*salt water (completions).*	owpb—*old well plugging back.*
†—*junked and abandoned.*	pb—*plugged back or plugging back.*
¶—*million feet of gas.*	r—*reaming.*
abd—*abandoned.*	rog—*rig on the ground.*
bbls—*barrels.*	rur—*rigging up rotary tools.*
br—*building rig.*	rust—*rigging up standard tools.*
b.s.—*basic sediment.*	sd—*shut down.*
csg—*casing.*	sdtr—*sidetracking.*
co—*cleaning out.*	sg—*show gas.*
dd—*drilling deeper.*	si—*shut in.*
dk—*derrick.*	so—*show oil.*
dr—*drilling.*	so&g—*show oil and gas.*
fsg—*fishing.*	spd—*spudding.*
ft—*feet.*	sr—*straight reaming.*
hfw—*hole full of water.*	sw—*salt water.*
in—*inches.*	td—*total depth.*
lcn—*location.*	ur—*underreaming.*
m—*milling.*	wih—*water in the hole.*
mim—*moving in materials.*	wo—*workover.*
mit—*moving in tools.*	wocs—*waiting on cement to set.*
mot—*milling on tools.*	wosr—*waiting on standard rig.*
n, s, e, w—*north, south, east, west.*	
oih—*oil in hole.*	

et al's Henley 1, sw sw sw 25-25s-9e, pb, set 6-in csg, woc. Eagle Oil Co.'s Stine 1, ne ne se 13-28s-10e, dr 250 ft. S. Van Devanter et al's Dove 1, ne se sw 12-28s-11e, skid 20 ft so. Whittaker & Johnson's Cannon 1, cel se nw 8-26s-13e, mach.

HARVEY COUNTY—Allison & Fitzwilliams et al's Hawks 1, se sw ne 16-24s-1w, sd 500 ft.

JACKSON COUNTY—Lemmick Oil Co.'s Marble Savings Bank 1, cne ne 26-9s-14e, spd and sd.

KEARNEY COUNTY—J. L. Murphy's Masonic Home 1, cne 1-26s-36w, sd 1468 ft.

KINGMAN COUNTY — Carter Oil Co.'s Davis 1, ce½ ne ne 24-28s-8w, ream 2376 ft.

LOGAN COUNTY—Morgan, Flynn Cobb et al's McMillan 1, cnw 9-13s-37w, sd 3489 ft.

MARION COUNTY—Western Kan. O. & Ref. Co.'s Suderman 1, se sw nw 22-20s-2e, dr 3110 ft.

McPHERSON COUNTY—C. E. Ash Drlg. Co.'s Broman 1, ne ne nw 19-17s-4w, dr 2820 ft. Wamhoff et al's Nuse 1, se ne sw 18-18s-4w, sd 1850 ft. Dole-Park Dev. Co.'s Doles 1, ne nw ne 12-19s-1w, sd. Clyde Pulse et al's Boesker 1, se se nw 29-20s-1w, rig. C. R. Craft et al's Barnholt 1, sw sw se 30-20s-5w, p 115 bbls oil, 9 hrs, sd. Boyle & Grossman's Diener 1, se se ne 35-19s-1w, dr 1490 ft. H. C. Becker et al's Mason 1, sw sw ne 9-17s-1w, td 3370 ft, D&A.

MEADE COUNTY—Pacific Mid-West Oil Co.'s Rexford 1, ne se sw 8-30s-29w, sd 900 ft.

MITCHELL COUNTY — Geo. Siedhoff et al's Greiss 1, nw sw se 16-8s-10w, sd 4022 ft.

NESS COUNTY—Newton Dev. Co.'s Tenny 1, nw nw se 19-18s-25w, sd 4406 ft. Jones & Lane's Page Milling Co. 1, se se nw 36-18s-26w, run 8-in csg 2968 ft.

OSBORNE COUNTY — J. E. Waldron's Neuschwanger 1, se ne nw 11-8s-14w, spd and sd. Fred Chaddox & Atlantic's Slater 1, ne sw ne 33-10s-15w, dr 3130 ft. F. E. Fullerton & Sons' Moray 1, ne se sw 27-10s-12w, sd 500 ft.

PHILLIPS COUNTY—C. W. Davidson et al's Ellif 1, se ne ne 35-5s-18w, sd 350 ft.

PRATT COUNTY—Atlantic, Cities Service & Skelly Oil Co.'s Runyon 1, sw nw ne 11-27s-13w, shot with 20 qts, co. Skelly Oil Co.'s Adams 1, se nw ne 2-28s-11w, ur 6-in csg. Stanolind O&G Co.'s Hartsell 1, nw nw sw 14-26s-12w, dr 3967 ft. Colonial Oil et al's Phelps 1, se se sw 4-26s-12w, lcn.

RENO COUNTY — Sam Schneider et al's Kroecker 1, ne ne ne 12-22s-5w, dr 2645 ft. Butler & Street's Kincaid 1, ne ne nw 13-24s-4w, rot rig. Carey et al's McPheeters 1, ne ne nw 22-26s-8w, spd and sd. W. E. Witt et al's Fair 1, nw se se 4-22s-8w, set whpstk 2415 ft, woc. Cohen et al's Teter 1, se se sw 3-23s-5w, rig. Westgate-Greenland et al's Popp 1, sw sw ne 7-25s-4w, rur.

RICE COUNTY—Gillespie et al's Strong 1, ne ne nw 9-18s-8w, spd and sd. John Hanna et al's Marshall 1, ne nw nw 30-18s-8w, sd 1515 ft. Skiles et al's Campbell 1, se se ne 28-19s-9w, set 7-in csg 2950 ft. Gerbrand-Pulse Oil & Drlg. Co.'s Wellman 1, sw sw sw 22-21s-9w, ur 8-in csg 2800 ft. Oread Oil Co.'s Erion Estate 1, nw nw nw 34-21s-7w, lcn. Bell O&G et al's Timbers 1, nw nw ne 8-21s-8w, rot rig. Elbar Corp.'s Ehlers 1, ne ne se 8-21s-9w, rot rig.

ROOKS COUNTY—W. W. Kiskadden et al's Ham 1, sw sw nw 25-7s-19w, ru. Graham et al's Fike 1, sw sw sw 9-9s-17w, fsg. C. R. Craft et al's Ziegler 1, ne ne sw 8-10s-16w, dr 3100 ft. J. H. Lester's Metheny 1, se se ne 29-20s-10w, co 3875 ft. Superior Oil et al's Cosey 1, se se se 35-10s-19w, rot rig.

RUSH COUNTY—Wakefield et al's Zimmerman 1, se se sw 7-16s-18w, sd 3120 ft. Wakefield & Brouk's Kerbs 1, nw nw se 11-17s-16w, spd and sd.

RUSSELL COUNTY—H. C. Eisenhour et al's Krouse 1, se se nw 18-13s-12w, spd and sd. Cities Service and The Texas Co.'s Boxberger "B" 1, ne ne ne 23-13s-15w, dr 3350 ft. Parks' Opdycks 1, sw sw sw 20-14s-13w, dr 970 ft. Emrichs et al's Anderson 1, ne se sw 33-15s-11w, spd and sd. Cities Service Oil Co.'s Eichman 1, csw sw se 12-15s-14w, dr 2755 ft. Phil-Han Oil Co.'s Deines 1, ne ne nw 33-14s-14w, dr 1165 ft. Trapp Drlg & Ramsey's Polcyn 1, ne ne se 34-14s-15w, set 8-in csg 2516 ft. Murfin & Vernon O&G Co.'s Pearson 1, ne ne ne 31-15s-15w, spd and sd. Parks et al's Gorham 1, sw nw ne 35-15s-15w, cel. C. L. Price' Sebesta 1, ne ne ne 36-15s-11w, dr 175 ft.

SEDGWICK COUNTY—Roxanna Drlg. Co. et al's Woodman 1, sw nw sw 26-26s-1w, sd 2469 ft. Nat'l Ref. Co.s' Fee 1, se ne se 36-27s-2e, est. 5,500,000 cf gas, 832 lbs rp. I. W. Murfin et al's Martin 1, se se nw 32-28s-1e, dr 2455 ft. W. C. Talbott et al's Downs Estate 1, se se nw 32-28s-2e, gauge 7,342,000 cf of gas, 847 lbs. rp. Palmer Oil Corp.'s Royal 1, ne ne ne 15-28s-1w, td 3899 ft, D&A. Union O&R et al's Howell 1, sw sw sw 6-29s-1e, dr 2010 ft. Fulton et al's Fee 1, ne ne se 35-28s-1e, co 918 ft. McKnab et al's Garrett 1, se sw sw 18-29s-2e, sd 100 ft.

STAFFORD COUNTY—W. P. Faulkner's Moses 1, nw nw sw 9-22s-13w, fsg 915 ft. Kessler O&G et al's Jenkins 1, se se ne 15-25s-12w, td 4214 ft, D&A. Fred P. Rust et al's Wm. Johnson 1, nw nw sw 29-25s-12w, dr 3650 ft. Colonial Oil et al's Scheufler 1, sw sw se 5-21s-11w, lcn. Fred Rust et al's Drach 1, ne ne sw 12-22s-13w, lcn. Kessler O&G Co. et al's Pinkston 1, ne nw 17-22s-14w, rot rig. Torry & Feaster et al's Allen 1, nw nw se 34-22s-12w, set surf csg.

STEVENS COUNTY — United Producing Co., Inc.'s Beardsly 1, cn½ 12-31s-35w, rur.

SUMNER COUNTY — W. M. McKnab's Blair 1, sw sw sw 7-30s-1e, dr 3300 ft. R. J. Wixon's Newton 1, se se se 21-30s-2e, sd 2023 ft. Magnolia Pet. Co.'s Baird 1, sw se se 2-30s-4w, dr 2955 ft.

TREGO COUNTY—Phillips Pet. Co.'s Trego 1, cne nw 14-12s-12w, dr 3966 ft. Central Commercial Oil Co.'s Locker 1, csw 12-14s-22w, cor 3680 ft. F. L. Thorn et al's Koeppen 1, se se sw 31-14s-24w, td 4429 ft, D&A. Thurman Hill et al's Lawson 1, sw sw nw 7-14s-22w, fsg 2730 ft. R. E. McNely et al's Hille 1, cse ne 22-15s-24w, dr 650 ft.

WOODSON COUNTY—Fred Rapp's Houghland 1, nw nw se 2-25s-15e, sd 1520 ft. Becker Bros.' Vann 1, cnw nw sw se 22-25s-14e, ur 6-in csg. Seibel's Kerschner 1, cnl ne ne 3-26s-15e, sd 1489 ft. Steinle's Kash 1, se se se 4-26s-15e, sd 1570 ft.

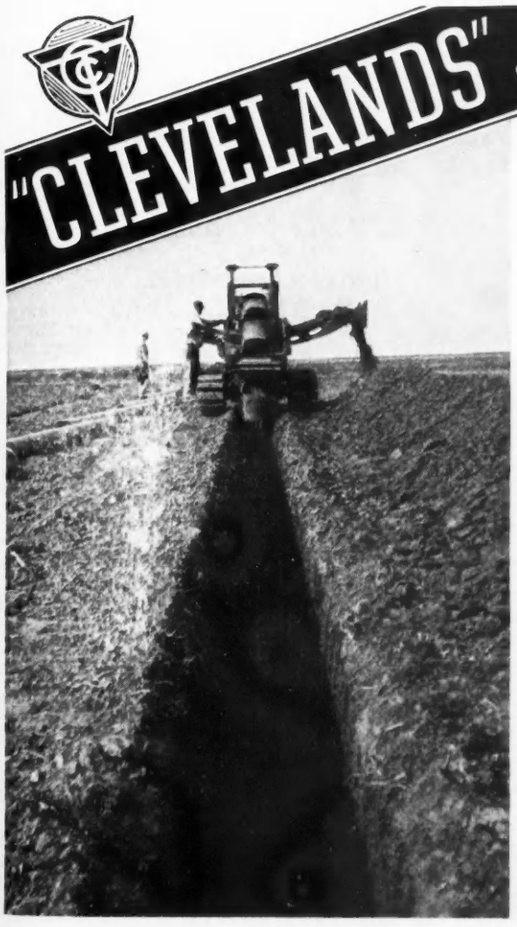
SOUTH LOUISIANA

ACADIA PARISH — Humble's Sarver 1, South Crowley area, 35-10s-1e, dr shale 8876 ft. Magnolia's Duson 1, Iota prospect, 14-8s-2w, dr shale 5390 ft. J. G. Markley et al's Daigle Farms 1, Churchpoint area, 19-7s-2e, dr shale 6814 ft. Gulf's Broussard 1, Midland area, 49-10s-2w, dr shale 1698 ft.

CALCASIEU PARISH—D. & D. Oil Co.'s Lutcher Moore 2, nw of Starks, 1-8s-13w, plugging back from 7365 ft. Union Sulphur's Bell 1, s of Sulphur, 10-10s-10w, spudded.

CAMERON PARISH — Humble's Miami Corp. 1, Catfish Lake area, 8-14s-3w, dr shale 3109 ft. Pure's State 2, Mallard Bay area, 14-13s-3w, abn 9445 ft. Superior's State 1, in Gulf of Mexico, 4-15s-8w, ru.

IBERIA PARISH—Jefferson Lake Oil Co.'s Lake Peigneur 414, Jefferson Island dome, 12s-



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5e, testing 6570 to 6576 ft. Texas Co.'s State 1, in Vermilion Bay, 16s-5e, dr shale 5524 ft.

JEFFERSON PARISH—Triangle Oil Co.'s Carroll 1, n of New Orleans, 125-12s-11e, fsh 3752 ft.

JEFFERSON DAVIS PARISH—Union Sulphur's T. R. S. Farms 1, South Roanoke area, 23-10s-4w, fsh 8603 ft; same operator's Calcasieu National Bank 1, Woodlawn area, 12-9s-8w, spudded.

LAFOURCHE PARISH—Amerada-Louisiana Land & Exploration Co.'s South Coast 1, Raceland area, 34-15s-19e, dr shale 8269 ft. Gulf's State PP3. Timbalier bay area, 36-23s-21e, dr shale 7250 ft. Wm. Helis' City of New Orleans 2, Marchland prospect, 19-23s-23e, attempted to blow out at 575 ft.

PLAQUEMINES PARISH — Gulf's State QQ 3, Quarantine Bay area, 17-19s-17e, dr shale 6798 ft.

ST. JAMES PARISH—Continental's Realty Operators 1, Hester prospect, 17-12s-5e, lcn.

ST. MARTIN PARISH — Texas Co.'s St. Martin Land 10, Henderson prospect, 15-8s-1e, coring shale 6509 ft; same operator's State 4, Lake Mongoulois area, 14-10s-9e, lcn.

ST. MARY PARISH—Texas Co.'s State 1, Batman Bay area, 21-16s-12e, dr shale 11,510 ft.

TERREBONNE PARISH — Barnsdall Oil Co.'s Brown 1, n of Gibson field, 110-16s-15e, woc 2475 ft.

VERMILION PARISH — Continental's Brookshire 1, Abbeville area, 66-12s-3e, fsh 11,909 ft.

MICHIGAN

ALLEGAN COUNTY — Lentz & Miller's Mogranstein 1, 1-3n-12w, dr 1770 ft. Champion Dev. Co.'s Siko 1, sec 9-1n-12w, lcn.

ARENAC COUNTY—Joe Zucker's Reed 1, 10-19n-5e, dr 2750 ft. Harvey Linabury's Smith 1,17-19n-6e, sd 2070 ft.

BAY COUNTY—Charles Weller's Dewyer 1, 20-16n-3e, dr 600 ft. Stork Oil Co.'s Century 1, ne se se 9-17n-3e, spd. Bell & Mark's Lowowski 1, 27-14n-3e, sd 2298 ft.

CLARE COUNTY—Wittmer Oil Co.'s Palomar 1, c sec 2-18n-5w, rig. McClanahan Oil Co.'s Mortenson 1, 9-18n-5w, bad hole 1665 ft.

GLADWIN COUNTY — Pollack-Gordon's Delbridge 1, 1-17n-2e, dr 2400 ft. Chapman Oil Co.'s State 1, c n½ nw nw 33-17n-2e, lcn. McClanahan Oil Co.'s Reua 1, ne ne sw, 11-17n-1e, lcn. Mt. Pleasant Drlg. Co.'s Raze 1, 33-19n-1w, rig. W. E. Ross, Tr.'s Kinyon 1, nw nw ne, 18-18n-2e, lcn. D. E. Hughe's Cox 1, 12-19n-2w, dr 3300 ft. C. E. McLaughlin's Simmons 1, 28-19n-2w, dr 300 ft. Whitehill & Clovis' Bosley 1, 11-19n-1e, dr 1150 ft. Dapar Oil Co.'s Villeneuve 1, 11-20n-2w, ur 1600 ft.

GRATIOT COUNTY — Red-Man Oil Co.'s Creaser 1, 18-11n-2w, dr 1000 ft. Sam Siegel, Tr.'s Kerr 1, 36-10n-1w, dr 2690 ft.

ISABELLA COUNTY—Boston Oil & Gas Co.'s Fox 1, 23-15n-5w, cmt 5 inch csg, testing so 3825 ft. C. E. Weller's Cotter 1, 11-15n-5w, dr 3600 ft. J. Golden Tabel's Kennedy 1, nw nw ne, 25-14n-4w, rig.

MIDLAND COUNTY—Sun Oil Co.'s State B-1, se ne, 5-16n-1w, mim. Mammoth Pro. & Ref. Co.'s Penny 1, 9-16n-2w, dr 3400 ft.

MONTCALM COUNTY — H. L. Gentry's Christensen 1, se nw ne, 29-11n-8w, mim. Ide & Glavin's Britten 1, 1-12n-5w, dr 2990 ft. Hirzel-Leland's Hansen 1, 31-10n-7w, dr 430 ft.

NEWAYGO COUNTY — Midstates Corp.'s Eichenberger 1, 7-16n-11w, dr 600 ft. Muskegon Dev. Co.'s McKinley 1, 36-11n-14w, dr 250 ft. Muskegon Oil Co.'s Carlson 1, 9-16n-12w, sd 3168 ft.

OTSEGO COUNTY — D. Geraldine, Tr.'s Fee 1, 34-30n-3w, lcn. Barton & Williams' Yuill 1, 9-32n-3w, dr 550 ft.

SAGINAW COUNTY—Bridgeport Oil & Gas Co.'s Tobias 1, 35-11n-5e, dr 150 ft. Weber Oil Co.'s Uebler 1, 9-11n-6e, lcn. Bond Oil Co.'s Schoomaker 1, 1-11n-1e, dr 3100 ft. Doran & Hilliard's Dobs 1, 33-11n-1e, sd 3030 ft.

ST. CLAIR COUNTY — Great Basin Oil Co.'s Ferguson 1, 17-7n-17e, sd 700 ft. Irwin Bryan's Maynard 1, 23-8n-16e, lcn. J. B. G. Co.'s Baldwin 1, 31-7n-17e, sd 615 ft.

TUSCOLA COUNTY—Frank Norton's Vorhees 1, 8-12n-11e, dr 900 ft. Jaenicke Oil Co.'s Boyce 1, 24-14n-7e, dr 900 ft.

MISCELLANEOUS COUNTIES — Alcona: Thalman & Morris' Kohlman 2, 10-26n-7e, dr 1800 ft. Alpena: Lester Hemp's Potter 1, 36-32n-6e, sd 830 ft. Emmet: Cheboygan Oil Co.'s McPhee 1, 15-35n-4w, dr 1100 ft. Huron: L. D. Hendershot's Klamp 1, 1-17n-14e, dr 380 ft. Lake: Cherry Valley Oil Co.'s Rice 1, 25-18n-12w, dr 670 ft. Oscoda: Burr Oil Co.'s Smith 1, 36-27n-2e, lcn. Ottawa: Morris Sutherland Drlg. Co.'s Brandt 1, ne nw ne, 36-5n-14w, lcn.

MONTANA

BIG HORN COUNTY—Daniels Petroleum Co.'s 1, se se 13-1s-33e, abd 4200 ft.

GLACIER COUNTY—W. E. Ullman's Allotted 1, csw 33-36n-3e, sd 4355 ft.

JUDITH BASIN COUNTY—Hunt et al's 3, nw se ne 30-14n-15e, dr 1750 ft.

PETROLEUM COUNTY—O. B. Canfield's Government 1, cwl se ne 21-17n-24e, abd 812 ft.

TOOLE COUNTY—Montana Gas Corporation's Clark 2, cse sw 34-37n-1w, dr 750 ft.

YELLOWSTONE COUNTY — Broadview Dome Oil Co.'s Halbritter 1, se nw 18-3n-23e, dr 2084 ft.

WYOMING

ALBANY COUNTY—Ohio Oil Co.'s D. J. Griffin 1, se sw 2-21n-77w, dr 1811 ft. Wyco Oil Co.'s Chappel 2, ne ne nw 33-21n-76w, lost hole at 840 ft, skidded rig 260 ft, nw and ru.

FREMONT COUNTY—Stanolind Oil & Gas Co.'s Johnson 1, cse se 3-33n-96w, dr 1321 ft.

NATRONA COUNTY—General Petroleum Corporation's Government 1, nw nw se 21-35n-77w, dr 515 ft.

SWEETWATER COUNTY—Mountain Fuel Supply Co.'s W. L. Williams 1, ce ne 5-12n-95w, dr 3066 ft.

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OKLAHOMA

ADAIR COUNTY — B. L. Maddox' Penn Mutual Life Ins. Co. 1 cs½ ne nw 5-16n-24e, dr 260 ft.

ATOKA COUNTY—A. L. Larson's Mason 1, sw se se 35-1n-14e, td 200 ft, D&A. C. M. Sheldon & Gardner Pet. Co.'s Lee 1, ne nw sw 2-4s-10e, td 842 ft, pb to 816 ft. Hagey et al's Becker 1, cne¼ 4-1n-13e, dr 2400 ft. Hagey et al's Peck 1, cne¼ 6-1n-13e, rig.

BECKHAM COUNTY — Mid-American Oil Co.'s Biscoe 1-A, sw sw sw 28-8n-22w, sd 2227 ft.

BRYAN COUNTY — Southern Oil Co.'s Henry 1, cnw ne 10-8s-7e, lcn.

CADDO COUNTY—Clyde Becker et al's Pharris 1, se se nw 24-6n-4w, sdo 6235 ft. I. T. I. O. Co.'s Dome-Bo 1, cne se 29-6n-10w, dr 4468 ft.

CLEVELAND COUNTY — Harper & Turner's Pollock 1, cw½ nw nw 13-9n-2w, woc 475 ft. Hollenback et al's Norman 1, nw nw ne 17-9n-2w, dr 7646 ft.

CHOCTAW COUNTY—V. K. Chapman & Low's Hallum 1, nw nw ne 4-7s-20e, mach.

COAL COUNTY—Phillips Pet. Co.'s Beck 1, se sw sw 6-1n-9e, dr 3804 ft. Carter Oil Co. et al's Claytor 1, cw¼ ne sw 27-2n-9e, woc 6016 ft.

COMANCHE COUNTY—J. W. Wolf's Costinus 1, sw sw se 30-4n-11w, spd. Frank Scott's Kuntz 1-A, se ne se 27-4n-11w, sd 2800 ft. Andrichak's Korthouse 1, nw ne sw 33-2n-18w, si.

COTTON COUNTY—Bowers & Wise' Pendergraft 1, nw se sw 4-4s-12w, der.

CREEK COUNTY—M. W. Mosier et al's Holcomb 1, se sw ne 19-18n-8e, dr cem.

GARFIELD COUNTY—H. R. Hollenback et al's Clark 1, nw nw nw 34-21n-6w, rig and mit.

GARVIN COUNTY—Carter Oil Co.'s Potts 1, ce½ se nw 36-1n-3w, dr 2777 ft. B. C. D. Edwards' Clark 1, ne ne ne 16-3n-3e, dr 2370 ft.

GRADY COUNTY—Gulf Oil Corp.'s Thomas 1, sw nw nw 14-4n-5w, dr 7973 ft. Doyle Pet. Co.'s Huffine 1, nw nw se 30-5n-8w, der.

GREER COUNTY — J. I. Medlin et al's Broudie 1, nw nw nw 5-6n-20w, dr 20 ft.

HASKELL COUNTY—Continental Oil Co.'s Ferguson 1, sw se ne 33-8n-20e, dr 6931 ft.

HUGHES COUNTY — Phillips Pet. Co.'s Becker 1, ne nw sw 8-5n-10e, dr 3626 ft. W. O. Allen et al's Barnard 1, sw sw sw 24-8n-8e, 2,000,000 cf gas, rp 1340 lbs, comp. E. H. Moore's Buck 1, cnw sw sw 21-8n-10e, ur 7-in csg 3892 ft. Pure Oil Co.'s Rogers 1, se se ne 18-8n-12e, td 390 ft, run 12½-in csg.

JACKSON COUNTY—Ace Gutowsky et al's Booker 1, nw nw nw 33-2n-18w, sdo 1012 ft. Ace Gutowsky's Lee 1, nw nw se 36-2n-19w, lcn. Ace Gutowsky's Howard 1, ne sw nw 10-3n-19w, sd 950 ft.

JEFFERSON COUNTY—Massas & Swansberger's Barrett 1, ne se se 14-6s-6w, ru and sd.

JOHNSTON COUNTY—Patton et al's McCrummens 1, sw sw ne 16-1s-6e, sd 1345 ft. W. T. Shelton's Chapman 1, cnw nw 26-4s-6e, sd 1812 ft.

KAY COUNTY—Fortuna Oil Co.'s Harris 1, sw sw ne 14-25n-1e, sd 383 ft. E. J. Shaffer et al's McKee 1, ne ne nw 20-28n-1w, spd and sd.

KIOWA COUNTY—E. L. Lippert's Miller 1-A, nw nw nw 14-2n-18w, bailing some oil and salt wtr. Kiowa Oil Corp.'s Finder 1, csw ne 4-6n-20w, tools out and sd. Hughes & Reese's Fultz 1, se se se 10-6n-18w, td 810 ft, si. H. L. Wirick et al's Noske 1, se se nw 1-6n-17w, sd 1205 ft.

LATIMER COUNTY — Clark Drlg. Co.'s Wilson 1, cse se 15-5n-18e, temp abnd.

LINCOLN COUNTY—Continental Oil Co.'s Community 1, nw nw se 7-15n-5e, cor 4509 ft, no show. C. L. Carlock et al's Young 1, cn½ nw nw 23-15n-5e, rur. Riley & Talbot et al's Weidler 1, nw sw nw 20-17n-2e, dr 720 ft. Ardie Oil Co.'s State 1, ne ne se 16-14n-4e, cor 4976 ft.

LOGAN COUNTY—Anthony & Marshall's Fruin-Eckman 1, se se sw 4-16n-1e, so&g, sd 5181 ft. Sunray & Olson's Canning 1, sw sw ne 31-17n-1w, dr 5430 ft.

MAJOR COUNTY—Ed Parsons' Patzkowsky 1, cnw¼ 10-20n-11w, rig.

MARSHALL COUNTY—Paul Robb et al's Vittitoe 1, cne se 11-5s-4e, co to 720 ft. F. W. Merrick, Inc.'s Robbinson 1, ne ne ne 33-7s-4e, lcn.

MURRAY COUNTY—Power Oil Co. et al's Lancaster Trust Co. 1, csw ne 10-1s-2e, to core. O. O. Owens' Fryer 1, ne se ne 34-1s-3e, 1400 ft wih, sd. Meyer & Greenup's Arbuckle Royalty Co. 1, nw nw ne 18-2s-3e, spd 48 ft and sd.

MUSKOGEE COUNTY—F. E. Cusack's Elliott 1, cnl nw sw 20-15n-20e, rog. Cusack's Fee 1, ne sw se 20-15n-20e, spd 65 ft.

NOBLE COUNTY—Seaboard Western Oil Co.'s Guthrie 1, nw nw ne 6-20n-2w, run 6⅝ in csg. Darby Pet. Co.'s McCoy 1, sw sw sw 24-23n-2w, cor 3581 ft.

OKFUSKEE COUNTY—Burke-Greis' Rhea

RAW DIET...TOUGH "INNERDS"

Gas Lift Devices Prove the Worth of Monel Working Parts

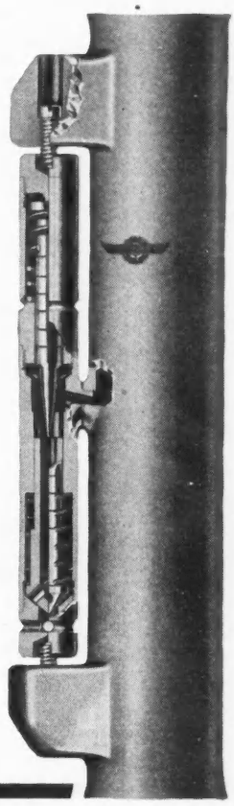
RAPID opening and closing—as frequently as 1800 times an hour—calls for strong and tough valves and springs. Grinding and cutting by sand, plus the cutting action of high pressure gas, demand a metal that's *hard* as well as tough. Add corrosive action from the hydrogen sulphide and brine in sour oil . . . and you realize the importance of the stubborn *resistance to corrosion* provided by Monel.*

Of all commercially available metals that are tough and hard Monel *is most resistant to this sort of corrosion.*

As you probably know, it is a tougher, harder metal than bridge steel. And "K" Monel,* the new heat-treatable Monel, can be tempered to over 300 Brinell. Both are completely and permanently rust free—and resist corrosion from hydrogen sulphide, brine and crude oils. That's why these long-life alloys have won first preference in scores of oil field and refinery applications. It explains why Gas Lift working parts, for instance, are mostly made of Monel or "K" Monel.

*Monel is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. This alloy is mined, smelted, refined, rolled and marketed solely by International Nickel.

INCO MONEL



But don't take the use of Monel for granted. Make sure of dependable operation, long, trouble-free life, for your Gas Lift Devices. Insist on having them equipped with Monel valves and springs. For further information write for Bulletin T-5 "Engineering Properties of Monel" and T-9 "Engineering Properties of 'K' Monel." Address:

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street **New York, N. Y.**

Gas Lift Device manufactured by Merla Tool Company, Dallas, Texas. Monel Valves and Springs resist corrosion and abrasion better than any other material used.

MONEL

WELCOME TO HOUSTON!

• We want to be the first to greet our fellow members of the Independent Producers Association, the last to say good-bye. As Houstonians, we are happy to see you in our home city; we hope that you find your stay here so pleasant, and so fruitful that you will come back again, and for a longer time.

While you are in Houston, be sure to stop by to see us. Most of you are friends of long standing, and we want to shake hands with you while you are here; those whom we haven't had the pleasure of meeting, we want to meet and get to know.

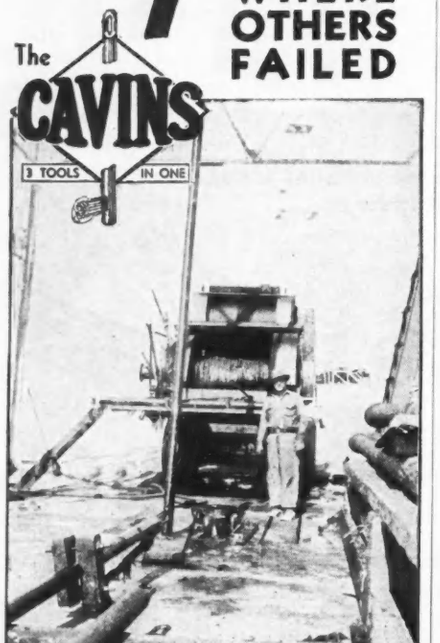
HOUSTON OIL COMPANY

OF TEXAS

Geo. A. Hill, Jr., President

PETROLEUM BLDG. **HOUSTON, TEXAS**

CAVINS Makes Good WHERE OTHERS FAILED



THE SNAPSHOT above tells a forceful story . . . the folly of using old-fashioned and inefficient tools for cleanout work. In the foreground are two types of bailers that failed on this cleanout job and had to be abandoned.

The Cavins Automatic Hydraulic Suction Bailer, standing in the derrick, was third on the job. It got right down to business and had this well cleaned out in jig time. The smiling operator indictates his satisfaction . . . it's a pleasure to run the Cavins.

For complete details of the Cavins, send for Bulletin No. 36.

THE CAVINS COMPANY

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TEXAS: Houston, Kilgore, Odessa, Big Spring, Monahans, Pampa
OKLAHOMA: Ada, Oklahoma City, Perry
NEW MEXICO: Lovington TRINIDAD, B.W.I.

1, sw sw se 14-10n-9e, dr 2030 ft. F. W. Merrick's Mackey 1, ne ne sw 29-11n-10e, dr 3355 ft.

OSAGE COUNTY—Nat'l Ref. Co.'s Page 2, nw sw se 28-22n-9e, lcn.

PAWNEE COUNTY—J. F. McManman et al's School Land 1, nw nw ne 16-21n-5e, set 7-in csg 3198 ft, woc.

PAYNE COUNTY—H. S. Brim et al's McKenzie 1, cwl se ne ne 13-18n-3e, C&P. Stanolind O&G & Amerada Pet. Corp.'s Bennett 1, nw se ne 31-19n-4e, lcn.

PITTSBURG COUNTY—Okla. Dist. Oil Co.'s Beeler 1, ne ne sw 7-7n-14e, co.

PONTOTOC COUNTY—Norbla Oil Co.'s McBride 1, ne ne sw 10-2n-5e, lcn. Union Dev. Co.'s Abbott 1, sw nw ne 34-3n-6e, dr pipe stuck 2500 ft. Boettcher O&G Co.'s Gann 1-A, se nw ne 25-4n-7e, fsg dr pipe 4347 ft.

POTTAWATOMIE COUNTY—Hightower's Baker 1, se se nw 27-6n-3e, mit. Roy S. Nash et al's Miller 1, cn½ ne se 29-6n-3e, fsg. Mid-Continent Pet. Corp.'s Ne-Thah-Pea-Se 1, se se ne 24-11n-4e, flow 135 bbls oil, 24 hrs, comp. Kerlyn Oil Co.'s Ball 1, nw sw nw 9-5n-3e, dr 3662 ft.

PUSHMATAHA COUNTY—Erle Halliburton et al's Bagwell 1, sw ne ne 30-2s-15e, dr 5265 ft.

ROGER MILLS COUNTY — Central Oil Corp.'s Lamb 1, se se se 27-14n-21w, C&P.

SEMINOLE COUNTY—Stanolind, Amerada et al's Salina 1, se ne nw 4-5n-6e, swb 27 bbls oil and 4 bbls wtr, 24 hrs. J. F. Root's Cone 1, nw ne sw 11-7n-5e, C&P. Phillips Pet. Co.'s Gilcrease 1, nw nw se 16-7n-12e, dr 3245 ft.

STEPHENS COUNTY — Coline Oil Co.'s Johnson 1, sw se ne 1-2n-8w, dr 9932 ft. Ed Parsons et al's Blake 1, csw nw 22-2n-8w, dr 5040 ft. Newsom's Pfile 1, sw sw sw 1-2n-7w, dr 3375 ft. Jack Cohen's Pierce 1, ne ne nw 24-2s-6w, dr 1550 ft.

TILLMAN COUNTY — Gulf Oil Corp.'s Prichard 1, se nw se 32-3s-16w, dr 4605 ft. Tom Walker's Bowman 1, sw sw nw 10-4s-17w, sd 200 ft. Caven et als Southerland 1, sw sw nw 35-4s-16w, sdo 44 ft.

WASHITA COUNTY—L. B. McWhirter et als' Fee 1, nw sw sw 34-8n-19w, sd 1810 ft. John Koberg's Harms 1, nw nw ne 6-10n-16w, sd 4200 ft.

WEST TEXAS

(This report is confined to Ordovician, Delaware and prospects west of the Pecos River).

BREWSTER COUNTY—Floyd C. Dodson, Duffy et al's Texas American Synd. 1-A, near c ne ne GH&SA Ry. sec 66, blk 10, elev 4228 ft, top Delaware shale 2297 ft, sr to deepen, td 6061 ft. Tony Hess et al's Mrs. N. Decis 1, sec 7, blk 1, Georgetown Ry. Co. sur, sd 925 ft. G. H. Storey et al's J. P. Wilson 1, c se nw T. & St. L. Ry. sec 3, blk 212, elev 3609 ft, trace oil 2358-65 ft, 2475-85 ft and 2520-35 ft, sd for cas, td 2545 ft.

CRANE COUNTY—Gulf Oil Corp.'s W. N. Waddell et al 6, c ne sw PSL sec 4, blk B-27, elev 2549 ft, dr 2905 ft; M. B. McKnight 2, c ne PSL sec 9, blk B-21, elev 2687 ft, top anhydrite 416 ft, top salt 585 ft, pb fr 5404 ft to 3650 ft, shot and sd to pump; McKnight 3, rur. Loffland Bros. Co.'s J. B. Tubb-Gulf 3, nw nw nw PSL sec 9, blk B-27, elev 2540 ft, top Simpson 5791 ft, top Ellenberger 5802 ft, tested water, dr 6760 ft. Sinclair Prairie et al's J. B. Tubb 2, nw nw sw PSL sec 3, blk B-27, elev 2552 ft, top Yates 1460 ft, top lime 2310 ft, top Simpson 5842 ft, top Ellenberger lime 6186 ft, pb fr 6391 ft to 5125 ft, perf cas 4470-4525 ft, used acid twice and swab 50 bbls oil 24 hrs. Wilcox O&G Co. et al's M. B. McKnight 1, c se nw G&MMB&A sec 9, blk 46, elev 2773 ft, dr lime 5455 ft.

CROCKETT COUNTY—Moore Bros. Corp. et al's Paul Perner 1, c nw I&GN Ry. sec 37, blk 2, elev 2560 ft, dr 3460 ft.

CULBERSON COUNTY—Jarrell, Earl Bell & Harrison's Caldwell 1, c sw of PSL sec 15, blk 109, sp and sd.

JEFF DAVIS COUNTY — H. D. Wilcox O&G Co. et al's Jones-Coffield 1, nec of H&TC Ry. sec 121, blk 4, sd 3315 ft.

EL PASO COUNTY—Tri-State Oil Co.'s Chas. & L. M. Kinkel 1, ne ne ne sec 237, S. F. No. 7232, dr 3095 ft.

TOM GREEN COUNTY—Humble's Lewis-Wardlaw 1, near c ne se H&TC Ry. sec 5, blk 17, elev 2142 ft, cem sur pipe.

HUDSPETH COUNTY—Haymon Krupp Oil & Land Co.'s K. S. Briggs 1, nw nw nw T&P Ry. sec 24, blk 73, Tsp. 7, dr 410 ft; S. J. Thaxton 1, near scc ne se T&P Ry. sec 34, blk 74, Tsp. 6, dr by junk at 3040 ft, td 3080 ft.

LOVING COUNTY—Barnett Pet. Corp.'s W. D. Johnson 1-A, se se ne T&P Ry. sec 12, blk 56, Tsp. 1, elev 3044 ft, dr 1960 ft; W. D. Johnson 1-B, ne se se T&P Ry. sec 2, blk 57, Tsp. 1, dr 2560 ft. Carpenter, Grierson et al's B. Barnes 1, se se sw PSL sec 22, blk C-25, lcn. Continental Oil Co.'s E. C. Marrs-Y. Bell 1, near sec nw T&P Ry. sec 20, blk 54, Tsp. 2, elev 2894 ft, dr 3195 ft. Michigan O&G Corp.'s M. Kyle 4, se nw ne T&P Ry. sec 20, blk 55, Tsp. 1, so&g, td 3927 ft, sd for shot; M. Kyle 5, ne ne se sec 20, lcn. Woodley Pet. Co.'s T. P. Land Trust 1, nwc n½ s½ of T&P Ry. sec 21, blk 55, Tsp. 1, fsh 2920 ft.

PECOS COUNTY — Aero Gas Ref. Co.'s Johnson-Skelly 1-A, n½ of H&GN Ry. sec 40, blk 8, sp and sd. F. A. Bond et al's O. W. Williams 1, near c sw se of GC&SF Ry. sec 3, blk 114, sd 210 ft. E. P. Cravens et al's J. C. Trees 1, ne nw se H&GN Ry. sec 63, blk 8, co 2273 ft. Mike L. Benedum et al's Joe C. Trees 1, sw sw sw H&GN Ry. sec 9, blk 8, Ordovician test, dr 1780 ft. J. J. Dorr et al's Payton 1, near se nw nw of H&GN Ry. sec 99, blk 8, elev 2439 ft, co 796 ft. D. W. Francis et al's Hadden-Westerman 1-A, nwc 186-ac lse, Rubian Phares sur, blk 166, elev 3155 ft, dr 1790 ft. Humble O&R Co.'s F. N. Belding 1, ne se sec 99, blk OW, dr by junk 670 ft, td 1390 ft. K. Kimberlin & Samwan Oil Co.'s Mrs. B. Young-Humble 1, sec 49, blk 10, H&GN Ry. sur, 200 ft oil in hole, sd for shot at 1807 ft. Magnolia Pet. Co.-Superior Oil Corp.'s J. H. McKee 1-A, near nw nw sw H&GN Ry. sec 24, blk 9, Ordovician test, elev 2385 ft (jkd twice), show gas 3100-03 ft, dr 3300 ft. T. N. Sloan-F. E. Lewis and Sloan-Zook Co.'s Dow Puckett 1, sw sw sw E. L. & RR. Co. sec 3, blk 100, sd 749 ft. Stanley A. Thompson et al's Elsinore Cattle Co. 1, se¼ of GC&SF Ry. sec 53, blk D, elev 3938 ft, dr by drill pipe 5445 ft, td 5804 ft. Trans-Pecos Oil Co.'s F. M. Gallagher 1, ne ne nw T&P Ry. sec 9, blk 51, Tsp. 10, run 10-in cas, td 1740 ft; Popham Land & Cattle Co. 1-B, s½ of GH&SA Ry. sec 235, blk 11 (third hole), run 12½ in cas 1000 ft. H. F. Wilcox O&G Co.'s Cerf 1, near c ne sw of T. & St. L. Ry. sec 27, blk 130, lcn.

PRESIDIO COUNTY — Brite Production Co.'s L. C. Brite 1, ne¼ of GH&SA Ry, sec 113, blk 12, tested 2½ bbls oil daily at 4367-75 ft, sdo.

REEVES COUNTY—Barnett Pet. Corp.-J. C. Hill and Conoco's Ely-Healy 1, c nw PSL sec 38, blk 71, elev 3166 ft, fsh 1400 ft.

SCHLEICHER COUNTY—John M. Cooper et al's Bert Page 2, c ne se GH&SA Ry. sec 40, blk L, elev 2289 ft, dr 4670 ft. Tex-Tor Oil Corp.'s Judkins-Spencer 1, c sw¼ of A. & B. sec 33, blk A, co 3135 ft.

SUTTON COUNTY—Ordovician Oil Co.'s J. T. Evans 1, ne ne ne sec 1, blk V-26, Lucy Stubblefield sur, elev 2126 ft, top black lime 2857 ft, dr 2915 ft.

TERRELL COUNTY—R. A. Basurto et al, J. H. Phelps-Bates 1, near sec nw¼ sec 5, G. W. Turley sur A-4, elev 2185 ft, fsh bailer, td 5600 ft. D. & S. Oil Co.'s Sam Bell 1, near swc ne sw of E. L. & RR. sec 68, blk D-7, sd 345 ft.

WARD COUNTY — McDowell & Weiner (was L. F. White et al's) Monroe-Rector 1, e cor W&NW Ry. sec 3, blk 1, elev 2649 ft, top Delaware lime 4635 ft, top Delaware sand 4670 ft, td 4710 ft, shot 260 quts 4635-98 ft, co and sd.

EAST TEXAS

ANDERSON COUNTY—Humble O&R Co.'s Southern Pine Lumber Co. 5-A (210-ac), John Morton sur, 2 mi ne Jarvis, elev 339 ft, Pecan chalk 3334-3666 ft, trace gas with salt water on dst at 4288-94 ft, dr 4940 ft.

BOWIE COUNTY—Ferguson & Hill's A. Y. Breckenridge 1 (412-ac), Nancy Dycus sur, 4 mi w Texarkana, top Annona chalk 1308 ft, top Blossom sand 2063 ft, sd 2950 ft. Russell & McGuire's B. Barkinson 1 (90-ac), J. W. Parkman sur, 2½ mi n Leary, elev 312 ft, dry and abd 2881 ft. Woodley & Bentley's J. D. Lumpkin 1 (245-ac), John McDermott sur, 1¼ mi sw Dalby Springs, elev 290 ft, Austin chalk 2984-3191 ft top Woodbine 3560 ft top Georgetown lime 3860 ft Fredericksburg lime 4410-4777 ft dry and abd 5690 ft.

CHEROKEE COUNTY—Merica Oil Co.-W. L. Stone's Cherokee Dev. Co. 1, A. J. Acker sur, 2 mi e Maydelle, dk. E. H. Moore, Inc., et al's Chronister Lumber Co. 1 (4500-ac), J. Durst sur, 3 mi ne Wells, sp.

DALLAS COUNTY—Mauldin Oil Co.'s W. E. Howell 1 (107-ac), S. Layton sur, 8 mi e Grapevine, sp and sd.

ELLIS COUNTY—Gigantic Oil Co., Inc.'s C. H. Sullivan 1 (90 2/3-ac), Simon Garcia sur, 4 mi n Frost, top Paluxy 3018 ft, sd 3742 ft.

FANNIN COUNTY—Stewart Oil Co. et al's Nathan Young 1 (67.24-ac), S. H. Hitchcock sur, near Randolph, dr 3620 ft.

FREESTONE COUNTY—Holt, Young & Nanley's W. H. Chambers 1 (125-ac), W. D. Allison sur, 2¾ mi n Keechi, elev 426 ft, top Pecan chalk 3980-4690 ft, Austin chalk 5327-5640 ft, dry and abnd 6165 ft. C. E. Rositer et al's J. P. Fulton 1 (441ac), J. P. Fulton sur, sd 956 ft. J. K. Hughes Oil Co.'s L. S. Foster 1 (21½-ac), C. E. Gary sur, se Kirvin, rig.

GREGG COUNTY—Humble O&R Co.-Gulf Oil Corp.'s E. D. Robertson 1 (11.4-ac), M. Mann sur, 2½ mi w by s Longview, 4 mi e

production, elev 272 ft, Pecan chalk 2263-2737 ft, Austin chalk 3329-3371 ft, top Georgetown lime 3371 ft, top Paluxy series 4541 ft, tested sw, dr upper Glen Rose 5330 ft.

HENDERSON COUNTY—American Liberty Oil Co.-E. B. LaRue et al's Johnson 1, blk 11, Phillips Jackson sur, 2 mi w LaRue, elev 464 ft, Pecan chalk 2765-2890 ft, Austin chalk 3811-4139 ft, top Woodbine series 4464 ft, top Georgetown lime 5520 ft, dr 6880 ft. Sherman Hunt, DeArman & McMillan's Dillard 1, H. Jefferies sur, 9 mi sw Maybank, elev 361 ft, top Pecan chalk 1738 ft, Austin chalk 2517-2868 ft, top Woodbine 3093 ft, top Georgetown lime 3725 ft, dr 3770 ft. Wm. McDougal, Tr. et al's Trinity Farm Securities Co.-R. M. Manning 1 (200-ac), H&TC Ry. sur, 4 mi s Malakoff, dk. Tide Water Associated-Seaboard & Humble's McElreath-Suggett 2-C (149-ac), W. P. Wyche sur, 1¼ mi nw Opelika, elev 452 ft, top Georgetown 5070 ft, top Paluxy 6087 ft, top first Glen Rose 6282 ft, top anhydrite 6991 ft, massive anhydrite 7315-7713 ft, flowed water at 7830 ft, dr Travis Peak 9320 ft.

HOPKINS COUNTY—V. Hughes et al's Hardaway 1, W. A. Irwin sur, 3 mi e of Ridgeway, top Pecan chalk 1538 ft, dr shale 3710 ft.

HOUSTON COUNTY — American Liberty Oil Co. et al's J. A. Bean 2 (31.05-ac), Wm. Burke sur, 1 mi n Grapeland, elev 515 ft, Pecan chalk 4684-4970 ft, top Austin chalk 5660-5975 ft, top Woodbine 6069-6087 ft, perf 7-in cas 6070-74 ft, flows about 2,000,000 ft gas and fluid, tests 10 percent oil, balance sw. Geier Bros. & F. B. Jackson's H. F. Moore 1 (53-ac), Henry Masters sur, 2 mi se Crockett, spd and sd. E. R. Mount, Branch et al's Dr. P. S. Griffith 1 (136-ac), Frank Johnson sur, 3 mi sw Crockett, sd 3250 ft.

HUNT COUNTY—Bauersfield & Aue, Inc. (was Texola's), J. M. Goin 1 (250-ac), Jas. Merrick sur, 2 mi sw Wolfe City, elev 606 ft, sd 1010 ft.

KAUFMAN COUNTY—J. M. Scott-J. B. Woodside et al's W. & T. Nash 1, (80-ac), Juan Cortez sur, 1 mi e Scurry, elev 401 ft, top Woodbine 2270 ft, top Georgetown 2849 ft, sd 3015 ft.

LAMAR COUNTY—Blackman & H. W. McGee's J. M. Duff 1 (75-ac), J. C. Lamb sur, near Powderly, sd 1022 ft.

LEON COUNTY—J. W. Kelley & Fox's L. W. Bryant 1 (48-ac), A. M. Coulter sur, 1 mi ne Marquez, rig.

LIMESTONE COUNTY — Pure Oil Co.'s Kendick 16-T (96-ac), 3 mi w Mexia and in field, elev 508 ft, top Woodbine 2896 ft, top Georgetown 3365 ft, top first Glen Rose 4270 ft, top broken anhydrite 5132 ft, top Travis Peak 5656 ft, base Travis Peak and top lower Marine 7675 ft, dr 7970 ft. Stanolind O&G Co.-Ramsey Pet. Corp.'s T. Norris 1 (40-ac), K. Thrasher sur, 5 mi n Kosse, Trinity test on Thornton fault, elev 528 ft, Austin chalk 2791-2890 ft, top Woodbine 2980 ft, top Buda 3085 ft, top Del Rio 3155 ft, top Georgetown lime 3255 ft, dr 3680 ft.

MORRIS COUNTY — Joiner Oil Corp.'s Morris Sheppard 1, MEP&P Ry. sur, 3 mi nw Naples, elev 340 ft, Pecan chalk 1915-2650 ft, dry and abnd 4502 ft. Jim O. Whittington et al's C. D. Browne-Joiner Leasing Synd. 1 (320-ac), T. C. Ry. Co. sur No. 734, 8 mi nw Naples, elev 264 ft, top Woodbine 3490 ft, top Georgetown lime 4089 ft, dry and abd 5014 ft.

NAVARRO COUNTY—Mrs. Jane Robinson et al's Fortsan Bros. 1, Eli Smith sur, 5 mi ne Corsicana, elev 345 ft, sp and sd. Tom Sharp et al's E. B. McDowell 1 (65-ac), T. J. Jordan sur, ½ mi s Bazette, dr 2830 ft.

RED RIVER COUNTY—E. R. Crosby et al (was Texfornia Co.-R. H. Manning's) Hocker-Hughes 1 (80-ac), M.E.P.&P. Ry. sur No. 642, 6 mi sw Lydia, elev 297 ft, Pecan chalk 995-1302 ft, top Austin chalk 2018 ft, top Woodbine 2815 ft, top Georgetown lime 3185 ft, top Paluxy 3770 ft, dr 4010 ft.

RUSK COUNTY—J. W. Shipman et al's Citizens Nat'l Bank-L. T. Burton 1 (125-ac), J. J. Y'Barbo sur, 4 mi ne Henderson, elev 432 ft, base Georgetown lime 3676 ft, sd 4500 ft.

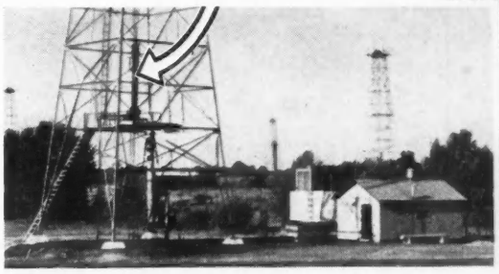
VAN ZANDT COUNTY—P. E. Hill et al's J. L. Chitty 1 (49½-ac), M. Neal sur, 12 mi s Canton, elev 512 ft, sd 2180 ft.

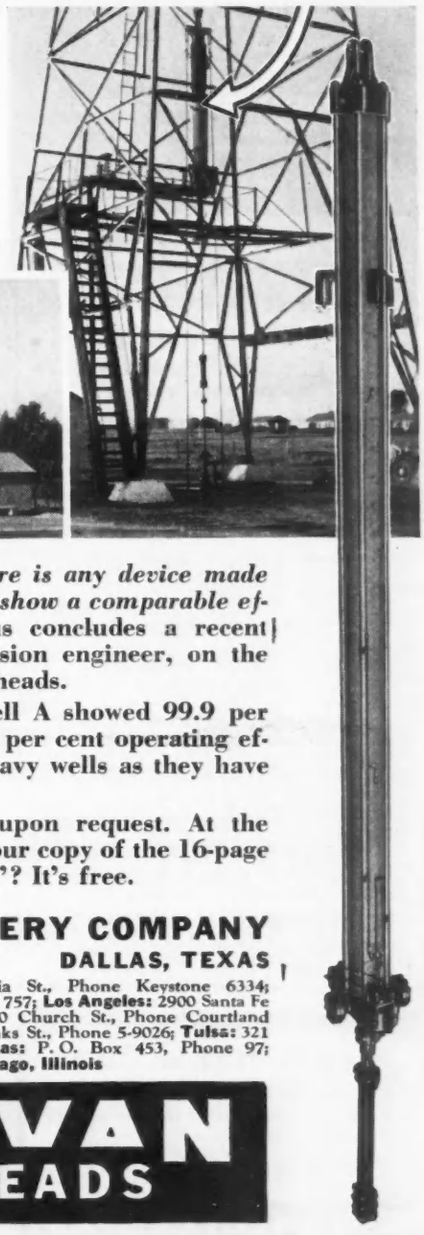
EAST TEXAS BORDER COUNTIES

HARRISON COUNTY—J. B. Bond's Bailey & Martin 1, George Martin sur, elev 299 ft, massive anhydrite 5378-5625 ft, dry abn, td 6518 ft.

MARION COUNTY—Ark. La. Gas Co.'s J. P. Fant 1, L. P. Cadenhead sur, hole clean, testing at 6158 ft, old td 6188 ft; Emma Ford 2, A. D. S. Coy sur, dr 5375 ft, shale and anhydrite; Wade Houston 1, A. D. S. Coy sur, dr 5527 ft shale and lime; Neilon 1, dr 1900 ft. Fohs Oil Co.'s Mary McReynolds 2, A. D. S. Coy sur, cored to 6191 ft, no shows, dr 6230 ft shale and strks lime; Mary McReynolds 3, dr 3325 ft, lime and shale. The Hunter Co.'s E. W. Fonda 3, A. D. S. Coy sur, wosr 6143 ft. Gulf's Henderson 2, dr 4560 ft. Shell's Lizzie

SULLIVAN PUMPHEADS HAVE HIGH OPERATING EFFICIENCY SAYS DIVISION ENGINEER





"I do not believe that there is any device made for producing oil, which can show a comparable efficiency of operation." Thus concludes a recent report by a well-known division engineer, on the operation of Sullivan Pumpheads.

After eighteen months, well A showed 99.9 per cent and well B showed 99.8 per cent operating efficiency. And these are as heavy wells as they have in the field.

Details will be supplied upon request. At the same time, why not ask for your copy of the 16-page booklet, "Selective Pumping"? It's free.

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SULLIVAN PUMPHEADS

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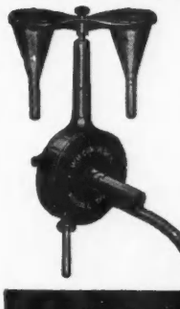

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Henderson 1, R. Bennington sur, completed as oil well, td 6014 ft. Holcomb & Thomasson's Gray & Taylor 1, dr 5600 ft shale and lime.

PANOLA COUNTY—Danciger O&R Co.'s J. W. Tatum 1, Alfred Bissell sur, coring 6500 ft. Magnolia Pet. Co.'s E. A. Hull 2, Thos. Applewhite sur, dr 8635 ft.

SHELBY COUNTY—Allen et al's George 1, C. C. Tutt sur, sd 2950 ft chalk. C. L. Cope's Pickering Lbr. Co. 1, Stephen English sur, rur. Redditt & Gray's Pickering Lbr. Co. 2, S. O. Pennington sur, rur.

SOUTH TEXAS

MIRANDO DISTRICT

DUVAL COUNTY—Cox & Hamon's W. R. Peters 1, sur 32, Cole sand with oil show 1882-98 ft, 30-minute drill stem test 1880-98 ft, 3/8 in. choke, no pressure, recovered 1200 ft salt water, pb to 1838 ft with 30 sacks, ran 7 in. to 1831 ft, woc, dr plugs. Joe Gier & Kone Prod. Co.'s W. R. Peters 2, sur 38, rig up. Navarro Oil Co.'s Standard Trust Co., tr 1, C E P Irr & Mg. sur, abnd 4521 ft. John J. O'Hern's M. B. Volpe 1, sur 170, coring 3192 ft. Porter, Talbot & Dorn's A. Montemayor 1, sub 2, sh 4, Las Anacuas gr, abnd 5666 ft. Slaughter & Hugle's J. B. Hunter Est. 1, J. Poitevent sur, dr 1900 ft. Smith & Hamill's Gruy Estate 1, sur 155, lcn. E. R. Thomas Est.'s E. V. de Pena 1, small sec 8, dr 4557 ft.

JIM HOGG COUNTY—Henry M. Brown, Tr., S. Gutierrez et al 1, sur 579, abnd 3524 ft.

McMULLEN COUNTY—Arthur J. Coyle's Two Rivers Ranch 1, sec 60, laying water lines. V. G. Schimmel et al's L. Kountz Est. 1, ET RR Co. sur, rig up. E. P. Tinney's J. Rutherford 1, Live Oak School Land sur, abnd 942 ft.

STARR COUNTY—Dean Bros.' M. Valadez 1, por 84, wait on pump, swabbed in with 200 ft oih. G. E. Dodd, Tr., Ben D. Wood 1-B, por 84, wocs 10 in. at 82 ft. McAlister-Espenlaub's Ben D. Wood 1, por 84, dr 880 ft. K. E. Merren's Starr County Cattle Co. 1-A, por 89 of Jefferies & Lambeth subd, si, sanded up. Sun's F. S. Guerra 1, por 111, dr 1635 ft. Transwestern's T. B. Slick School 1, sur 266, coring shale 5767 ft.

WEBB COUNTY—Adams & Lefevre's E. Garcia 1, sur 592, wocs, pb, td 1866 ft, will perf 1860-66 ft. French Oil Corp.'s S. Benavides 3, sur 704, sd 712 ft. Kirkwood & Morgan's H. G. de Juarez 1, sur, 1005, complete 1944 ft, sand 1937-44 ft, 7 in at 1937, 125 bbls daily on pump. E. J. Pearl et al's De la Garza Est. 2, sur 48, set 5½ in at 2100 ft, preparing to dr plugs, td 2110 ft. Randon Oil Co.'s Joe C. Palmer 1, sur, 474, coring 1804 ft.

ZAPATA COUNTY—Eugene Mays et al's Adela G. de Flores 1, Dorothy subd, Charco Redondo gr, abnd 2515 ft.

SAN ANTONIO DISTRICT

ATASCOSA COUNTY—Brown & Bell's G. C. Atkins 1, BS&F sur 3, dr 4800 ft, oil show in Navarro. L. W. Stieren's T. A. Crawford 1, J. O. Crawford sur 69, dr 1184 ft.

BASTROP COUNTY — H. & H. Drilling Co.'s Earl C. Erhard 1, Hill's Prairie community, abnd 3654 ft. Marts & Beavan's C. L. Lackey 1, Joshua Gray sur, coring 2190 ft.

BEXAR COUNTY—Ed. Auge's J. A. Hernandez 1, F. L. Paschal sur 52, w.ll mi 10-7-37. C. J. LeComte's Albert Herbst 1, Manuel Leal sur, sd waiting on pump 700 ft. Whitfield & Draper's G. Ickey et al 1, Tom Gortaris sur 5, abnd 1027 ft.

CALDWELL COUNTY—B. E. Armstrong et al's Wilson Bell Est. 1, Solomon Seal sur, complete on pump, no gauge, td 2447 ft. R. T. Belcher, Schreiner et al's Mrs. G. Moody 1, Solomon Seal sur, bailing 2130 ft. Brady Bros. & Pummel's A. B. Jackson 1, S. Morris sur, resumed dr 1621 ft. Ellmag Oil Corp.'s W. Pope 1, J. D. Rains sur, mir.

DIMMITT COUNTY — Teas & Maryland Corp.'s S. E. McKnight 1, I&GN RR sur, ran drill stem test 1800-2100 ft, light gas blow, testing 2010 ft, Wilcox Oil & Gas Co.'s Light Ranch (David) 4, I&GN sur, dr 2935 ft.

EDWARDS COUNTY—Dan Auld et al's L. K. Henderson Est. 1, HE&WT sur, spudded.

FRIO COUNTY—Amerada's Mrs. D. D. Harrigan 1, S. Flores sur 306, si, td 6410 ft. Pagenkopf & Jamieson's Houston Est. 1, J. Figuerroa sur, wocs 2651 ft, 7 in at 2579 ft, dr plugs.

GUADALUPE COUNTY — Housel Oil Corp.'s N. J. Carter 2, Samuel Highsmith sur, lcn.

MAVERICK COUNTY — Wellington Oil Company of Delaware's Chittim Ranch 1, I&GN RR sur, swabbing again, 3287 ft.

WILSON COUNTY—O. H. Arnold et al's T. F. Black 1, S. & J. Arocha sur, dr 380 ft. Diamond Half Oil Co.'s R. C. Donaho 1, J. Reynolds sur, dr 2408 ft. Pat Higgins' Mrs. Annie Higgins 1, A. Trevino sur, dr 30 ft, ran 10 in, did not cement.

CORPUS CHRISTI DISTRICT

BEE COUNTY—J. R. Dougherty's R. T. Hicks Est. 3, J. M. Uranga gr, drill stem test, 8 minutes 3657-70 ft, recovered 100 ft oil and 80 ft mud cut with oil, 12 pounds, ¼ and ⅜ in choke, coring sand with shale and lignite to 3674 ft, running 7 in.

BROOKS COUNTY — Standard of Texas' Mestina O&G Co. 1, (lse 1), R. G. Salinas sur, dr 4277 ft; Mestina O&G Co., 9 (lse 1), R. G. Salinas sur, dr 2464 ft; 2 (lse 2), R. G. Salinas sur, flowed sulphur water, 19 hours, perf 2363-2404 ft, pb to 2391 ft, will perf again.

DeWITT COUNTY — Dirks Bros.' E. T. Clark 1, Jose Santos sur, dr 1250 ft. Whitex Co.'s J. G. Kerlick 1, Marcus Sowell sur, lcn 4400 ft Yegua test.

HIDALGO COUNTY—Atlantic's Mrs. E. T. McCalip 1, sec 175 Llano Grande gr, dr 3104 ft. Dee Davenport et al's Hidalgo County District, sec 262, La Mestina gr, dr 6415 ft. Gulf States Oil Co.'s Delta Orchards 2, sec 94, La Mestina gr, sd 2845 ft.

JIM WELLS COUNTY—H. M. Hill et al's Bertha Kuether 1, SK&K sur, rig installed, laying fuel line. Magnolia's A. A. Seeligson 7, Los Jaboncillos sur, set 7 in at 6795 ft.

KARNES COUNTY—Herbert Aid's Union Central 1, J. Poitevent sur, dr 2015 ft. Ivan Howard's F. P. Moczygamba 1, E. Seguin sur 5, running electric formation tester, td 2300 ft.

LIVE OAK COUNTY—Mills Bennett Prod. Co.'s Watson & Shipp 2, P. Salinas sur, abnd 4851 ft. Reynosa Oil Co.'s Bessie Alexander

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Chestnutt 1, Luis Ayres sur, prep to spud. Standard of Texas' E. C. Nicholson 1, J. T. Shannon sur, dr 300 ft.

NUECES COUNTY—Camp Prod. Corp.'s C. P. Wardner 1-A, Paso Ancho Abajo and Paso Ancho Ariba surs, flowed 120 bbls 54.5 gravity orange distillate 24 hours, ¼ in choke, tbg 2250, csg 2475, perf 6481-85½ ft with 9 shots, well heading, td 6521 ft. L. M. Lockhart's Ollie Purl 1, Ross Peters subd 2, coring 7194 ft. Sannex Oil Co.'s Emil Nesloney 1, Casa Blanca gr, prep to spud. Southern Minerals Corp.'s Richard King 2, blk 6, King Farm Lots, dr 2790 ft. Sultex Oil Co.'s L. M. Vance 5, Thomas Gallagher sur, cutting out liner, will deepen to 8000 ft sand. Union Producing Co.'s A. B. Simmonds 1, Agua Dulce gr, lcn. United Prod. Corp.'s T. S. Schroeder 1, A. F. de la Fuentes sur, coring 7605 ft.

REFUGIO COUNTY—Hogan Oil Co.'s J. S. Kelly 1, James Power sur, dr 3112 ft.

SAN PATRICIO COUNTY — Argo Oil Corp.'s A. Soehnge 1, P. J. & M. Delgada grant, dr 3603 ft. H. J. Porter et al's J. H. Schmalsteig 1, Coleman-Fulton Pasture Co. Lands, rig up. F. P. Schwab's H. A. Smith 1, Juan Hart & Sons grant, abnd 6400 ft.

VICTORIA COUNTY — Gulf Oil Corp.'s Mahon & Buehler 1, J. Poitevent sur 2, dr 5414 ft. Stanolind's Henderson & Pickering 1, E. Benavides sur, coring sand 6372-98 ft, drill stem test 6375-98 ft, recovered 24 stands salt water in 15 minutes, ⅜ and ¼ in choke, coring ahead in sand, 6398 ft, td.

WILLACY COUNTY — Magnalia's F. Armediaz 1, San Juan de Carricitos gr, dr 3310 ft. Shell's Yturria Cattle Co. 2, San Juan de Carricitos gr, dr 6215 ft.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933.

Of The OIL WEEKLY, published weekly at Houston, Texas, for October 1, 1937.
State of Texas, County of Harris, ss:

Before me, a Notary Public in and for the State and County aforesaid, personally appeared A. L. Burns, who having been duly sworn according to law, deposes and says that he is the Business Manager of The OIL WEEKLY, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:
Publisher: R. L. Dudley, 3238 Huntington Drive, Houston, Texas.
Editorial Director: S. W. Robinson, 5002 Scotland, Houston, Texas.
Editor: Warren L. Baker, 1126 Crocker St., Houston, Texas.
Managing Editor: J. Kent Ridley, 1018 Isabella, Houston, Texas.
Business Manager: A. L. Burns, 1751 Marshall, Houston, Texas.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)
The Gulf Publishing Company, Houston, Texas; James Anderson, Houston, Texas; R. L. Blaffer, Houston, Texas; Mrs. Sarah Campbell Blaffer, Houston, Texas; A. L. Burns, Houston, Texas; J. F. Carter, Jr., Tulsa, Okla.; Dr. N. L. Dudley, Goose Creek, Texas; R. L. Dudley, Houston, Texas; W. S. Farish, Houston, Texas; Wm. V. Gross, Houston, Texas; Howard R. Hughes, Houston, Texas; Chas. H. Lane, Houston, Texas; Wallace E. Pratt, Houston, Texas; J. Kent Ridley, Houston, Texas; S. W. Robinson, Houston, Texas; Mrs. Maude G. Sterling, Houston, Texas; R. P. Swinsky, New York, N. Y.; O. R. Waller, Chicago, Ill.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state).
None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

A. L. BURNS, Business Manager.

Sworn to and subscribed before me this 27th day of September, 1937.
(Seal) J. KENT RIDLEY.
(My commission expires June 1, 1939.)

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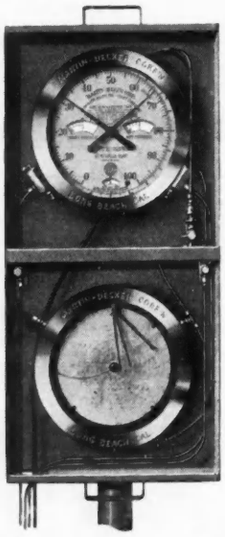

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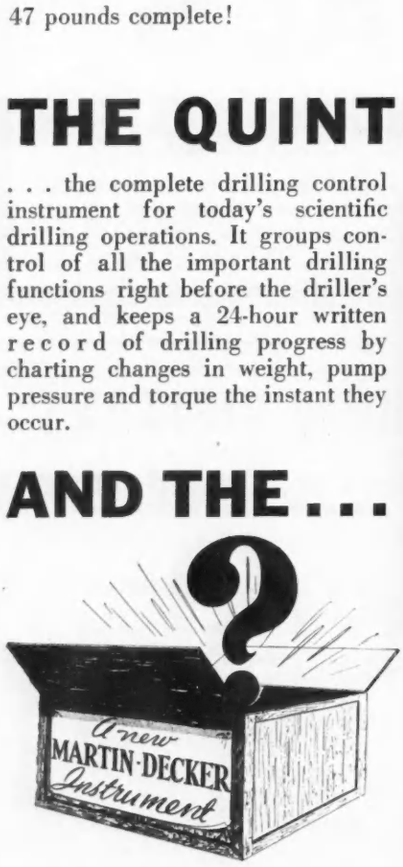

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The oil industry spends over twelve million dollars every year in laboratory research work!

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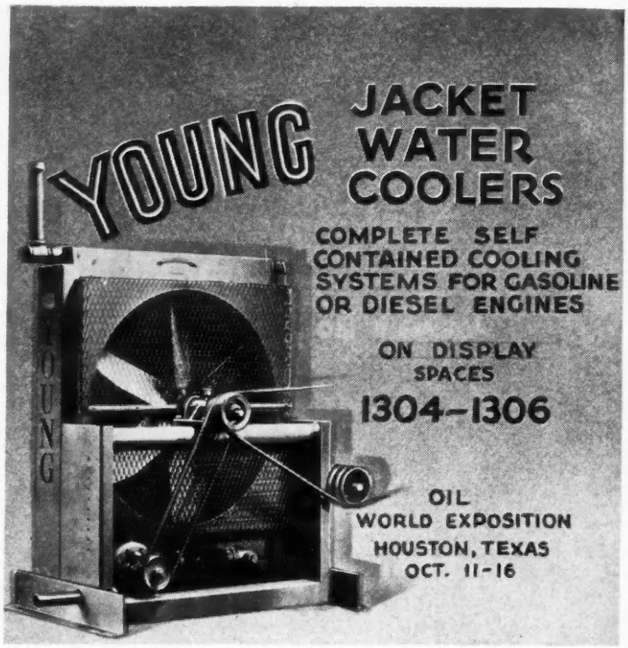

Designed to provide a recirculating cooling system to operate with any type of jacketed stationary or portable engine, these units are ideal for engines in pumping service where water is difficult to obtain or where it contains impurities injurious to engine jackets. Young coolers are easily portable, self-contained, including fan, water pump, bearings and drive. The fan may be engine driven or by a separate electric motor. Structural steel construction, with electric welding the units are built to stand the hardest service. Tanks, top and bottom are of heavy gauge copper with all joints brazed. Furnished in a range of sizes from 25 to 125 H.P. All sizes carried in stock and immediate shipment can be made.

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PIPE THREADER
Beaver Pipe Tools, Inc.

Beaver Pipe Tools, Inc., Warren, Ohio, announces development of its No. 48-R pipe threader. the features of which may be summed up as follows:

An extra wide die—with a wide throat to center and hold the tool on the pipe, which eliminates the annoyance of having the tool drop out of threading position when a power drive is applied, the gears are fully enclosed so that chips and dirt cannot get in them; the driving pinion is straddle-mounted with a bearing both above and below the gear teeth on the pinion; the dies are held in position by a spring-backed ball, which is fully enclosed that dirt cannot get back of it; the proper position for setting dies to cut "standard" thread is marked by a shoulder on the tapered post, which makes accurate setting possible, even under poor lighting conditions.

This pipe threader is recommended for high-pressure piping where tight joints are absolutely essential.

DUPLEX POWER PUMP
The National Supply Company

The National Supply Company of Delaware, Toledo, Ohio, has recently introduced a new duplex power pump for general oil field work, especially oil gathering, water and slush service. This is designated as the Ideal type D-50, and has a maximum fluid cylinder bore of 5 inches with a stroke of 10 inches. The maximum working pressure of the fluid end is 1000 pounds, and the maximum rated hydraulic horsepower is 50 at 60 r.p.m.

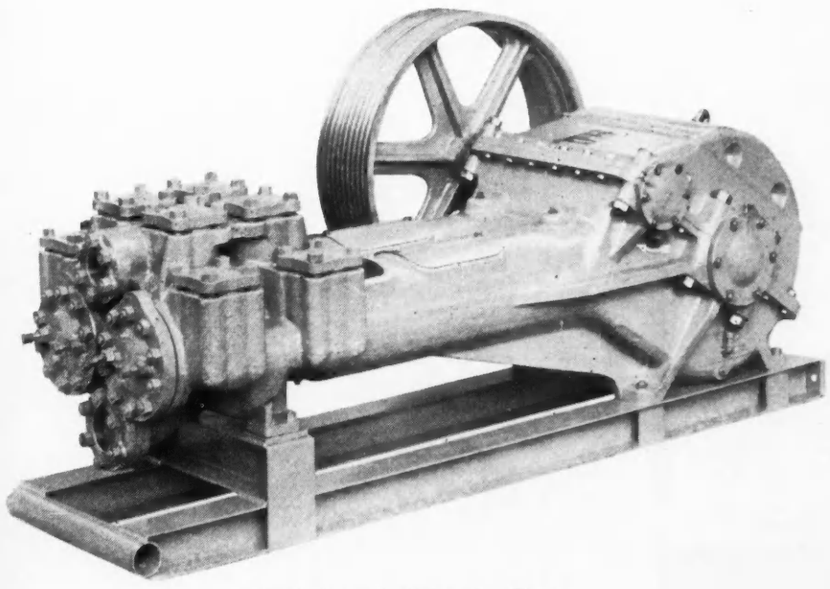
The frame is a two-piece high-test iron casting, heavily ribbed for strength and rigidity and split at the pinion and crank-shaft bearings. This allows the installation of the shafts with gears and bearings as complete units, adding to operating convenience. It also makes possible a narrower and stronger frame, since no extra width is required for assembly of parts within the case. Slush and other liquids are also effectively excluded by a special baffle-wall assembly.

The gear and pinion are heat-treated Sykes herringbone generated by National. The pinion and pinion shaft are forged integrally, and the shaft diameter is left unusually large to effectively minimize deflection. The crankshaft is carried on two large Timken bearings and the pinion shaft on two SKF self-aligning roller bearings.

The fluid end is a one-piece alloy iron casting, reinforced at point of greatest stress, with all sections made as nearly cylindrical and spherical as possible for maximum strength. Large direct fluid passages and valve openings eliminate unnecessary flow resistance.

Fluid cylinder liners are firmly supported in the cylinder and are packed against fluid leakage by a rubber ring behind the liner collar. This packing can be tightened without removing the cylinder head. Fluid pistons and rods are available in several types to cover all the usual field requirements. The use of alloy steel intermediate rods makes it unnecessary to open the crankcase when changing liners and pistons. Fluid valves of the same design as those on the larger Ideal slush pumps are available for slush service, and bronze or Durabla valves for oil or special water service.

Flood lubrication of a positive and automatic type is used on all working parts while the crank and pinion bearings are grease packed through connections easily accessible from the outside of the case. A V-belt drive is regular, although belt, chain or direct connected drives can be used. The regular skid mounting consists of two heavy steel H-beams with welded cross members. A platform for engine or motor rails is provided.



Ideal Type D-50 Duplex Pump.

STEAM DRILLING ENGINES
Ajax Iron Works

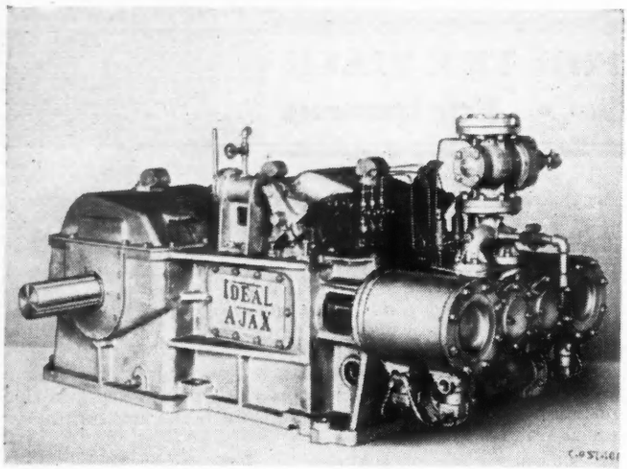
Ajax Iron Works, Cory, Pennsylvania, has announced new horizontal type twin-cylinder steam engines of an entirely new design. These engines are available in three sizes, 7-inch, 8-inch, and 9-inch cylinder bore by 8-inch stroke. Operators will note that this horizontal type of engine to which they are accustomed, provides easy access to the working parts. The engines offer numerous economical applications over the conventional sizes of twin-cylinder steam drilling engines.

Several of the applications include: direct drives to rotary, (engine located above or below derrick floor, depending on field conditions); direct drives to mud pumps by means of "V" belts or chain; dual engine hook-up for driving rotary, mud pump and for hoisting pipe.

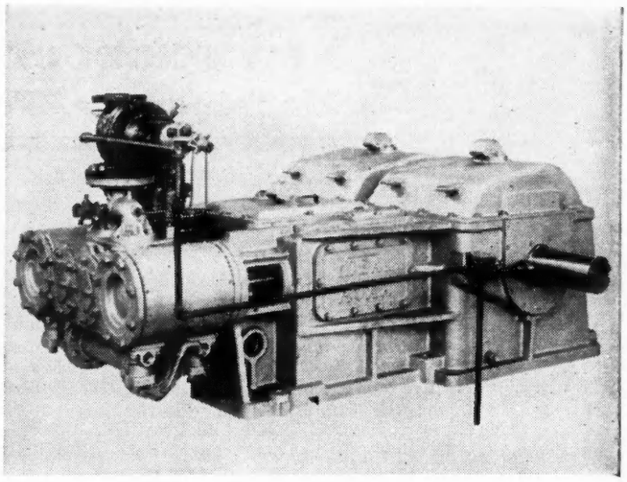
For Rotary Machines these engines offer a compact and economical drive. Direct Rotary Drive Type "A" (above floor) is a self-contained enclosed unit. The drive to the rotary pinion shaft extension is through an enclosed lubricated chain. A sprocket on the rotary shaft extension gives an emergency drive to or from the draw works. The Type "B" (below floor drive) allows for more clear derrick floor space. For this drive the engine is placed beneath the derrick floor and connected to an extension shaft, which carries two clutch sprockets, one for direct drive to the rotary and one for emergency drive to the draw works. These drives eliminate the need for a separate stand-by engine which would be idle most of the time. Rotary drive engines are full reversing type with the throttle and steam kicker controls located at the drillers regular position.

For driving mud pumps, great savings in steam consumption can be obtained by driving power pumps with these small engines. As regularly furnished for separate mud pump drive the engines are non-reversing, the eccentrics being set to run "under" to give the proper rotation to the pump pinion shaft. The driving sheave may be located on either the right or left hand shaft extension. The installation of an automatic combination throttle and engine stop valve insures against accidents from engine overspeeding. Adjustment is provided for obtaining the proper belt tension.

Dual engine drive consists of two engines mounted on a skid carrying all clutches, bearings and couplings. When drilling, one engine drives the slush pumps, one drives the rotary, and while making a round trip the power of both engines is



Ajax Reversible Drive Steam Engine



Ajax Pump Drive Steam Engine

available. The driller has control of both engines from his regular position.

Some of the engine specifications include: one piece completely enclosed frame lagged and jacketed cylinders, piston steam valves, automatic cylinder relief valves, heavy forged double extension crankshaft, tapered roller shaft bearings, bronze back babbitt lined crank pin boxes, metal rod packings, heavy force feed cylinder and valve lubricator, adjustable cut-off on reversing engines.

FORGED STEEL WELD FITTINGS

Henry Vogt Machine Company

Henry Vogt Machine Company, of Louisville, Kentucky, has added drop forged steel socket weld fittings to its line of drop forged steel valves and fittings.

These weld fittings are provided with socket ends to receive the pipe, thereby making certain proper alignment before and after welding. No weld "icicles" can clog the pipe or fitting because of the socket construction. Because of the similarity of materials in fittings and pipe, it is easy to obtain sound welds. Whether standard, extra strong or double extra strong pipe is used, a smooth passage through pipe and fittings is assured since the fittings are bored to match the inside diameter of the pipe. Vogt drop forged steel socket weld fittings are available from stock in a full range of sizes.

AUTOMATIC SHALE SEPARATOR

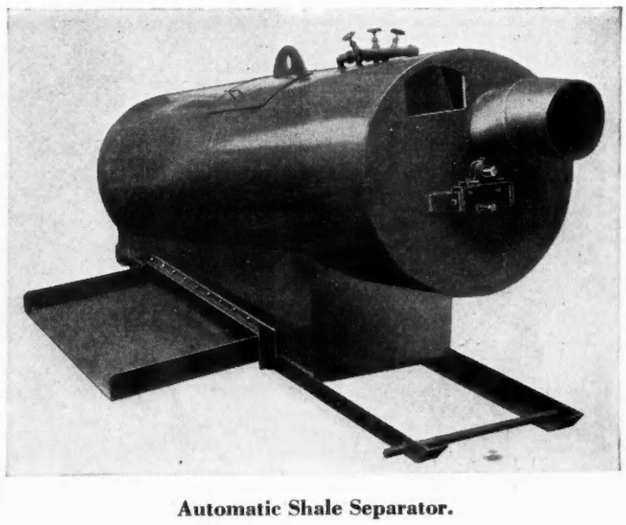
Lucey Products Corporation

Lucey Products Corporation, 910 South Boston Avenue, Tulsa, Oklahoma, recently announced the development of the Hudson-Boucher automatic shale separator.

Operated by the gravity flow of the drilling fluid against turbine blades attached inside the front end of the screen cylinder, the machine requires no other motive power. The machine effects complete separation by the rotation of the screen unit as the fluid passes through. Clean mud passes through the screen, down into the return trough, while cuttings are discharged out the open end of the screen cylinder.

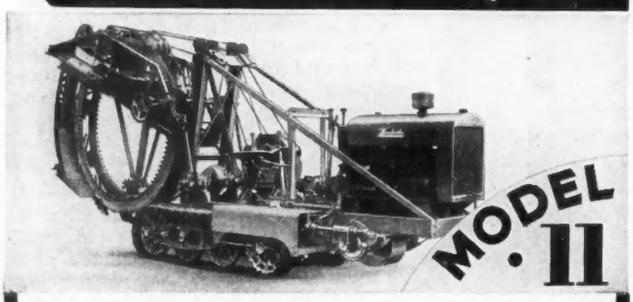
The screen proper is 6 feet long and may be adjusted to proper tension by manipulation of the adjusting bars which run the length of the screen. On top of the housing a manifold is provided for the introduction of clear water to thoroughly clean the screen and cuttings. This feature provides for the salvage of much useful mud that ordinarily clings to the cuttings and is lost.

Requiring no drive, the shale separator requires a minimum of attention and upkeep expense.

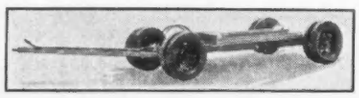


Automatic Shale Separator.

A Buckeye DITCHER
for TRENCH 10" to 22" WIDE
• OVERALL WIDTH OF MACHINE ONLY 52"
• EASILY HANDLED IN CRAMPED QUARTERS



Big ditcher efficiency and economy comes to the small ditching field in the Buckeye Model 11. Built for steady, time saving operation, with speed for easy going and rugged strength for the toughest jobs – features of Buckeye engineering that always save you money on any job. Before you buy a ditcher, be sure you have the facts about Model 11.



This specially designed Buckeye trailer is for quick and easy transportation of the Model 11. The ditcher climbs onto the trailer under its own power, fully assembled.

THE BUCKEYE TRACTION DITCHER CO., FINDLAY, OHIO

Strength Safety Reliability Economy

—characteristics of every Kennedy Valve

ENNEDY Valves are *reliable* because of their simple, sturdy and effective operating mechanisms. They are *economical* because of their durability which assures long service with minimum maintenance expense. Their generous proportions of all parts assures ample *strength* and complete *safety*. The Kennedy line includes a specially designed and exactly suitable type for every oil and gas industry service.

The Kennedy Valve Mfg. Co.
Elmira, N. Y.

Send for the Kennedy Catalog

KENNEDY
VALVES-PIPE FITTINGS-FIRE HYDRANTS

BRANIFF AIRWAYS — GREAT LAKES TO THE GULF

ECONOMY

THIS is the fundamental advantage of Braniff Airways service. Not only do you save an appreciable amount of hour-dollars in travel time, but you save yourself!

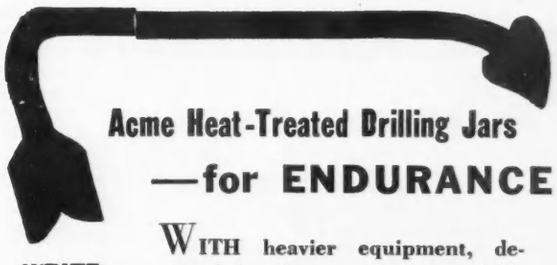
ATTEND THE MEETING IN HOUSTON OCTOBER 14—ECONOMICALLY

Fly a Braniff airliner into Houston for the Annual Meeting of The Independent Petroleum Association of America. Conserve your time and energy. Braniff's dual fleet of luxurious Douglas airliners and smooth-flying Lockheed Electras assure you a pleasant and profitable trip.

FOR INFORMATION OR RESERVATIONS . . .

Call the Braniff office in your city, your leading hotel, travel agent, Postal Telegraph or Western Union.

BRANIFF Airways INC. — THE B LINE — "GREAT LAKES TO THE GULF"



Acme Heat-Treated Drilling Jars —for ENDURANCE

WRITE FOR NEW CATALOG No. 12

WITH heavier equipment, designed for faster and deeper drilling operations, drillers *these days* must have Jars that will "stand much punishment."

While Jars, necessarily, remain the same size, Acme knows the "secret" of making them to "take it"—in ordinary drilling or "shaking bit loose."

Acme Jars are uniform in high quality; made of especially selected Jar steel, and expertly heat treated for toughness.

Write for New Catalog, showing complete Acme "Drilmor" Line. Filled with information to aid you in meeting the toughest drilling and fishing problems.

ACME DRILLING & FISHING TOOLS

ACME FISHING TOOL CO.

PARKERSBURG, WEST VIRGINIA

"The Mark of Highest Quality Since 1900."

This Week with the Industry's EQUIPMENT SUPPLIERS

American Iron & Machine Works Opens Plant in Kansas

American Iron & Machine Works Company, Oklahoma City, announces the opening of a machine shop and warehouse at Great Bend, Kansas.

The Kansas plant is equipped with new and up-to-date machinery specially selected for the territory served in this greater Kansas field.

The new plant is under the supervision of R. E. (Bob) Craine formerly in charge of the Seminole, Oklahoma, shop. The company has branches in five of the major producing oil states.

L. J. Brown Calls Hole In One and Makes It

Many a golfer has stepped to a tee and predicted a hole-in-one only to see it fail, but L. J. Brown, president of International-Stacey Corporation, Columbus, Ohio, a member of the Scioto Country club had the satisfaction of making good his prediction Wednesday, September 29. Playing with J. M. Aitkin, R. B. McCleery and O. N. Havekotte at Scioto, he called the shot from number four. Brown used a number three iron for the shot on the 198-yard hole.

Carl H. Graham, General Manager Bull-Stewart Equipment Company

Bull-Stewart Equipment Company, 5219 East Grand Avenue, Dallas, Texas, has appointed Carl H. Graham, vice president and formerly manager of the Houston and San Antonio branches, general manager of all branches, with headquarters at Dallas. Graham has been with the company since its formation.

Another change in the Bull-Stewart Equipment Company's personnel is the appointment of R. B. Johnson, formerly connected with the Dallas branch, as manager of the Houston office.

CARL H. GRAHAM
New General Manager for Bull-Stewart Equipment Company

A. T. Donley Joins A. M. Byers Company

A. M. Byers Company, Pittsburgh, announces adding A. T. Donley, formerly with Allegheny Steel Company, to its sales staff. He will be in charge of steel tubular sales in the petroleum industry. His headquarters will be 1270 Arcade Building, St. Louis, Missouri.

Byron Jackson Opens Sales Office in Illinois

Byron Jackson Company, Los Angeles, announces establishment of a sales and service office at 425 South Fair Street, Olney, Illinois, with O. W. Morgan, Jr. in charge.

Neal Higgins Heads International Harvester Industrial Sales

International Harvester Company, 606 South Michigan Avenue, Chicago, recently announced a realignment of its sales department personnel, and as a result, Neal Higgins has been placed in charge of all industrial tractor and power unit sales through branches, dealers, and manufacturers, while R. C. Flodin, heretofore in charge of the division, has been assigned new responsibilities.

Higgins has been closely identified with the sale of the company's industrial power lines for the past five years. He was for three years traveling industrial sales representative on the Southern district before being called to the Chicago office early last year to promote tractor and power equipment sales through dealers in the entire country.

Oil Equipment Service at Corpus Christi Adds Lines

Oil Equipment Service, 823 Nixon Building, Corpus Christi, Texas, announces the appointment by W-K-M Company and Rector Well Equipment Company to serve these manufacturers as office representative in the South Texas territory. This organization, owned and operated by Be Russell, who was formerly a member of Shell Petroleum Corporation's production department, now represents a number of equipment manufacturers not maintaining complete office facilities in Corpus Christi.

Brooks Named Sales Promotion Manager for Westinghouse

Westinghouse Electric International Company, East Pittsburgh, Pennsylvania, recently announced the appointment of D. C. Brooks, as sales promotion manager.

Brooks was educated in England, and in 1928 entered the merchandising division of Westinghouse in this country. He was later connected with the company's London office, where, in addition to his activities in England his work took him to France, Algeria, Morocco and Tunisia.

Brooks will be head of the sales promotion division, which will carry on the sales promotion and advertising activities of the company. He will make his headquarters at 150 Broadway, New York.

D. C. BROOKS
Sales Promotion Manager for Westinghouse Electric International Company

Ralph L. Wilson Engineer for Climax Molybdenum

Climax Molybdenum Company, 500 Fifth Avenue, New York City, announces the appointment of Ralph L. Wilson, formerly connected with The Timken Roller Bearing Company, Canton, Ohio, as metallurgical engineer in its development field.

A graduate from Lehigh University in 1921, Wilson served on the metallurgical staff of United Alloy Steel Corporation from 1921 to 1926 and with its successors, Central Alloy Steel Corporation, until 1928. He then was appointed assistant metallurgical engineer of Timken Steel & Tube Company, becoming metallurgical engineer of the same company in 1933.

Wilson has been active in A.S.T.M. committees on steels for service at elevated temperatures for many years. He is a member of the Refining Division of the American Petroleum Institute, and a trustee of the American Society for Metals. He is author and co-author of numerous articles and technical papers dealing chiefly with the metallurgy of steel for high temperature applications.

Headquarters for Wilson will be in the Canton, Ohio, office of Climax Molybdenum Company. He will devote much of his time to furthering the development of suitable steels for elevated temperature service in oil refineries and also for boilers.

Jones & Laughlin Supplies Pipe for New York Gas Line

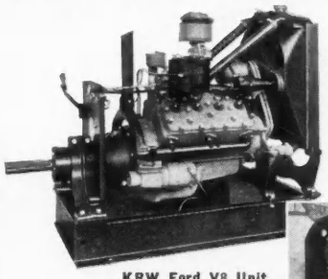
Jones & Laughlin Steel Corporation, Pittsburgh, is supplying the pipe for the new pipe line being installed by New York State Natural Gas Corporation from its gas wells recently drilled in the Woodhull field, Steuben County, New York, to the main line running from Coudersport, Pennsylvania, to Syracuse, New York.

More than 200 tons of J & L 12¾-inch double length seamless pipe, joined by Dresser couplings, are being installed, and the line is designed to carry the gas at a working pressure of 500 pounds per square inch. This 12-mile spur line, started August 21 and scheduled for completion some time in October, is the main outlet for gas produced in this field.

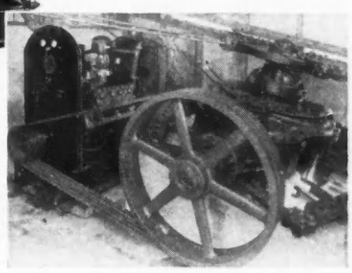
LOW COST POWER

with this

KRW-FORD V8 UNIT



KRW Ford V8 Unit Operating Pump Jack



ALSO KRW ELECTRIC PLANTS
Produce your own electric power at a fraction of present cost. Eliminate peak load and stand-by charges. Both 110 and 220 volts—20,000 watts. Runs on gasoline or natural gas.

Here's dependable, low-cost power up to 60 H.P.—complete, compact, portable. Ideal for welders, compressors, hoists, pumps, pump jacks and other oil field equipment. For complete information, prices and data showing how a K R W Unit will pay for itself *out of savings* in a few weeks, write us or see your local Ford Dealer.

K. R. WILSON, 20 Lock St., Buffalo, N. Y.
Exclusive Builders of Approved Ford Shop Equipment Since 1916

See the
MERCO CENTRIFUGAL SEPARATOR
in actual operation!

W.K.M.'s BOOTH No. 1002
HOUSTON OIL WORLD EXPOSITION

MERCO CENTRIFUGAL SEPARATOR CO.
subsidiary of
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Engineers

FOR DESANDING and RECONDITIONING ROTARY DRILLING MUDS

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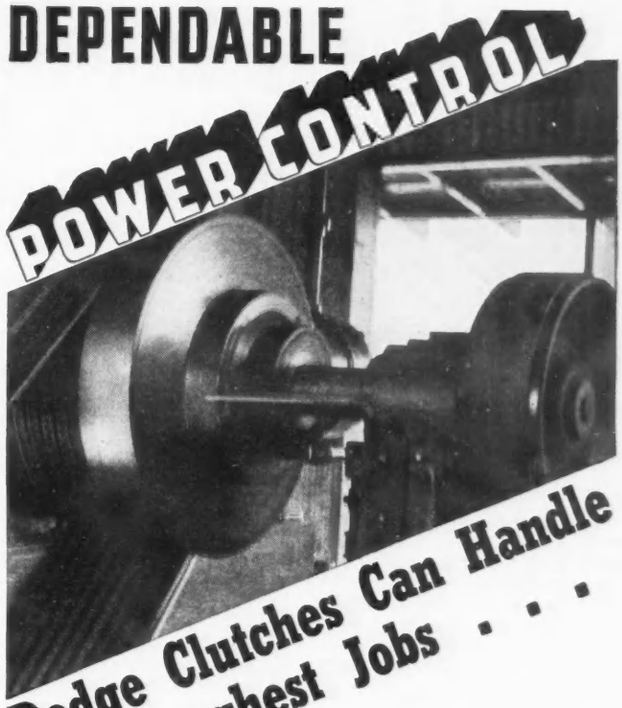
DEPENDABLE POWER CONTROL



Dodge Clutches Can Handle the Toughest Jobs . . .

Dodge Diamond "D" Friction Clutches are efficiently, dependably, and economically adapted to power transmission as well as for application to various types of machinery used in the oil fields. They are ruggedly constructed and capable of handling 100% overload, insuring safety and protection and positive power control under any conditions of service.

•

See the Dodge 20-page section in the Oil Field Composite Catalog

•

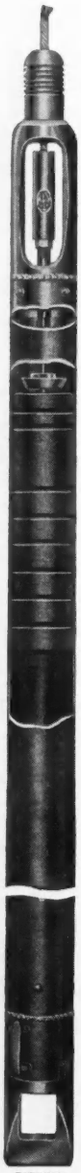
Specify Dodge Diamond "D" Clutches for steady, uninterrupted service. Send for copy of Catalog No. A-200.

DODGE MANUFACTURING CORPORATION
MISHAWAKA, INDIANA, U. S. A.

THE Right DRIVE FOR EVERY JOB

DODGE
MISHAWAKA
THERE IS ADDED VALUE IN THE NAME DODGE

It's Wise to USE A MILLER SAND PUMP first!



Because sand and sediment in your wells make them poor producers. With a MILLER, the Sand Pump with the powerful suction action you can remove these causes of poor production, quickly at small cost. *Get* ALL *your oil with a* MILLER.

The MILLER is made in diameters of 2½, 3, 3½, 4, 4¼, 5, 5½, 7 and 9 inches and lengths of 20, 25 and 30 feet. 5/32-inch wall thickness in REGULAR Type, ¼-inch wall tubes HEAVY Type Sand Pumps.

INTERCHANGEABLE BOTTOMS
To Meet Every Condition

- **BAILER BOTTOM**
  With the Bailer Bottom installed the MILLER is quickly changed to a Bailer giving you a combination of either Bailer or a Sand Pump in one tool.
- **SAND BOTTOM**
  Used when tools are run and when well is shot to quickly remove loose material.
- **STAR BOTTOM**
  Used for cutting the sand loose.
- **CHISEL BOTTOM**
  (In Pump)
  With this bottom tightly packed sand can be easily broken in small pieces so it can be picked up in the pump.

Write for Descriptive Folder and Price List

See Page 1186 COMPOSITE CATALOG

PATENTED
NO. 1370340
NO. 1523808
NO. 1787390
NO. 1952628
NO. 1966028
NO. 2055667

MILLER Sand Pump Co.

General Offices and Shop, Box 4516
OKLAHOMA CITY, OKLA., U. S. A.

Branch Shops and Offices:
SAPULPA, OKLA. and KILGORE, TEX.

FOR SALE BY SUPPLY STORES EVERYWHERE

Squeaks from the Bull Wheel

Last Stop

"Fish-Hook, that's an odd name for a station. Why do you call it that?"

"Well, it's the end of the line."

Oh!

Milliner: "That dark hat goes wonderfully well with your pale complexion, madam."

Customer (breathlessly): "But I only became pale when I heard the price."

Spite!

A gay party was in progress, with a noisy redhead the center of attraction. Two ladies watched the merrymakers.

"See that redhead?" observed one. "I understand she's celebrating her eighteenth birthday."

"Why not?" meowed the other lady. "Better late than never."

He'll Never Learn

"What's the matter up at Tom's house?"

"They're taking 'im away in the ambulance for beating 'is missus."

Sticking to His Guns

Soon after a matron obtained a cat from the Animal Shelter she telephoned back to say they would not keep it. "I'm awfully sorry," she said. "It's a dear, and we are fond of it, but the cat is a bird killer and we just can't have a bird killer.

"I'm sure my husband would be glad to make a contribution to the shelter for your trouble in taking the cat back," she added, "but he is up north shooting ducks."

They've Escaped

G-Man: "Got away, has he? Did you guard all the exits?"

Country Constable: "Yes, but we think he must have left by one of the entrances."

Looks That Way

"D'you know, I sometimes wonder if my husband's grown tired of me."

"Whatever makes you say that?"

"Well, he ain't been home for seven years."

HERE'S THE PROOF

Here is the 900-pound grizzly bear shot by Dal Legan, superintendent of Tide Water Associated Oil Company, Houston, on the big Wyoming wild-game hunt participated in by 26 oil supply men.

Dal, the boy with the grim, retrospective look on his face, killed the bear with one shot from a 30.06 rifle, the bullet neatly parting the bear's hair on the front of his head. This picture should effectively put at rest the reports that Dal ran the bear to death, with Dal in front. However, it does lend considerable credence to the rumors that when the bear's carcass was opened it was found to contain a prize assortment of candy bars, peanuts, pop bottles and other delicacies with which the tame bears in the National park are fed by tourists. This Dal denies. The photograph, however, is published exactly as it was furnished The OIL WEEKLY by a member of the party, not Dal.

The facts in the case, as reported by this member are that the guide and another member of the party passed the bear by. Dal was following them when, from a distance of 50 yards, he saw the bear raise up from a log at which he was grubbing. Dal was on higher ground than the bear.

He had four cartridges in his gun. Here was the opportunity of which he had dreamed —"If I can't get him with four cartridges I'll have to out-run him," flashed through Dal's mind. He still has the other three shells, unexploded.